E类业余无线电台操作证书考试题库 (共622道)

E1 COMMISSION RULES
佣金规则

E1A Operating Standards: frequency privileges; automatic message forwarding; stations aboard ships or aircraft; power restriction on 630 and 2200 meter bands
操作标准：频率特权；自动消息转发；船舶或飞机上的车站；630米和2200米波段的功率限制

E1A01. Which of the following carrier frequencies is illegal for LSB AFSK emissions on the 17 meter band RTTY and data segment of 18.068 to 18.110 MHz?
以下哪种载波频率对于17米波段RTTY和18.068至18.110 MHz数据段上的LSB AFSK发射是非法的?

A. 18.068 MHz ✓
18.068兆赫
B. 18.100 MHz ✗
18.100兆赫
C. 18.107 MHz ✗
18.107兆赫
D. 18.110 MHz ✗
18.110兆赫

E1A02. When using a transceiver that displays the carrier frequency of phone signals, which of the following displayed frequencies represents the lowest frequency at which a properly adjusted LSB e
当使用显示电话信号载波频率的收发器时，以下显示的频率中的哪一个表示正确调整的LSB e的最低频率

A. The exact lower band edge ✗
确切的低频带边缘
B. 300 Hz above the lower band edge ✗
低频带边缘以上300 Hz
C. 1 kHz above the lower band edge ✗
低频带边缘以上1 kHz
D. 3 kHz above the lower band edge ✓
低频带边缘以上3 kHz

E1A03. What is the maximum legal carrier frequency on the 20 meter band for transmitting USB AFSK digital signals having a 1 kHz bandwidth?
用于传输具有1kHz带宽的USB AFSK数字信号的20米波段上的最大法定载波频率是多少?

A. 14.070 MHz ✗
14.070兆赫
B. 14.100 MHz ✗
14.100兆赫
C. 14.149 MHz ✓
14.149兆赫
D. 14.349 MHz ✗
14.349兆赫

E1A04. With your transceiver displaying the carrier frequency of phone signals, you hear a DX station calling CQ on 3.601 MHz LSB. Is it legal to return the call using lower sideband on the same fr
当你的收发器显示电话信号的载波频率时，你会听到DX电台在3.601 MHz LSB上呼叫CQ。在同一个fr上用下边带回电话合法吗

A. Yes, because the DX station initiated the contact ✗
是，因为DX工作站启动了联系
B. Yes, because the displayed frequency is within the 75 meter phone band segment ✗
是，因为显示的频率在75米的电话频段段内
C. No, the sideband will extend beyond the edge of the phone band segment ✓
不，边带将延伸到电话频带段的边缘之外
D. No, U.S. stations are not permitted to use phone emissions below 3.610 MHz ✗
不，美国电台不允许使用低于3.610 MHz的电话发射

E1A05. What is the maximum power output permitted on the 60 meter band?
60米波段允许的最大功率输出是多少?

A. 50 watts PEP effective radiated power relative to an isotropic radiator ✗
相对于各向同性辐射器的50瓦PEP有效辐射功率
B. 50 watts PEP effective radiated power relative to a dipole ✗
相对于偶极子的50瓦PEP有效辐射功率
C. 100 watts PEP effective radiated power relative to the gain of a half-wave dipole ✓
相对于半波偶极子增益的100瓦PEP有效辐射功率
D. 100 watts PEP effective radiated power relative to an isotropic radiator ✗
相对于各向同性辐射器的100瓦PEP有效辐射功率

E1A06. Where must the carrier frequency of a CW signal be set to comply with FCC rules for 60 meter operation?
CW信号的载波频率必须在哪里设置，以符合60米操作的FCC规则?

A. At the lowest frequency of the channel ✗
在频道的最低频率
B. At the center frequency of the channel ✓
在频道的中心频率
C. At the highest frequency of the channel ✗
在频道的最高频率
D. On any frequency where the signal's sidebands are within the channel ✗
在信号边带位于信道内的任何频率上

E1A07. What is the maximum power permitted on the 2200 meter band?
2200米波段允许的最大功率是多少?

A. 50 watts PEP ✗
50瓦PEP
B. 100 watts PEP ✗
100瓦PEP
C. 1 watt EIRP (Equivalent isotropic radiated power) ✓
1瓦EIRP（等效各向同性辐射功率)
D. 5 watts EIRP (Equivalent isotropic radiated power) ✗
5瓦EIRP（等效各向同性辐射功率)

E1A08. If a station in a message forwarding system inadvertently forwards a message that is in violation of FCC rules, who is primarily accountable for the rules violation?
如果消息转发系统中的一个站点无意中转发了违反FCC规则的消息，谁对违反规则负责?

A. The control operator of the packet bulletin board station ✗
数据包公告板站的控制操作员
B. The control operator of the originating station ✓
始发站的控制操作员
C. The control operators of all the stations in the system ✗
系统中所有站点的控制操作员
D. The control operators of all the stations in the system not authenticating the source from which they accept communications ✗
系统中所有站点的控制操作员未验证其接受通信的来源

E1A09. What action or actions should you take if your digital message forwarding station inadvertently forwards a communication that violates FCC rules?
如果您的数字消息转发站无意中转发了违反FCC规则的通信，您应该采取什么行动?

A. Discontinue forwarding the communication as soon as you become aware of it ✓
一旦意识到，立即停止转发通信
B. Notify the originating station that the communication does not comply with FCC rules ✗
通知始发站通信不符合FCC规则
C. Notify the nearest FCC Field Engineers office ✗
通知最近的FCC现场工程师办公室
D. All these choices are correct ✗
所有这些选择都是正确的

E1A10. If an amateur station is installed aboard a ship or aircraft, what condition must be met before the station is operated?
如果业余电台安装在船上或飞机上，在电台运行之前必须满足什么条件?

A. Its operation must be approved by the master of the ship or the pilot in command of the aircraft ✓
其操作必须得到船长或飞机驾驶员的批准
B. The amateur station operator must agree not to transmit when the main radio of the ship or aircraft is in use ✗
业余电台操作员必须同意在使用船舶或飞机的主无线电时不进行发射
C. The amateur station must have a power supply that is completely independent of the main ship or aircraft power supply ✗
业余站必须有一个完全独立于主船或飞机电源的电源
D. The amateur operator must have an FCC Marine or Aircraft endorsement on his or her amateur license ✗
业余操作员必须在其业余执照上有FCC海军或飞机背书

E1A11. Which of the following describes authorization or licensing required when operating an amateur station aboard a U.S.-registered vessel in international waters?
以下哪一项描述了在国际水域操作美国注册船只上的业余电台所需的授权或许可?

A. Any amateur license with an FCC Marine or Aircraft endorsement ✗
任何获得FCC海事或飞机认可的业余执照
B. Any FCC-issued amateur license ✓
任何FCC颁发的业余许可证
C. Only General Class or higher amateur licenses ✗
只有普通级或更高级别的业余执照
D. An unrestricted Radiotelephone Operator Permit ✗
不受限制的无线电话操作员许可证

E1A12. What special operating frequency restrictions are imposed on slow scan TV transmissions?
慢扫描电视传输有哪些特殊的工作频率限制?

A. None; they are allowed on all amateur frequencies ✗
没有一个所有业余频率都允许使用
B. They are restricted to 7.245 MHz, 14.245 MHz, 21.345 MHz, and 28.945 MHz ✗
它们被限制为7.245 MHz、14.245 MHz、21.345 MHz和28.945 MHz
C. They are restricted to phone band segments ✓
它们仅限于电话波段
D. They are not permitted above 54 MHz ✗
它们不允许高于54 MHz

E1A13. Who must be in physical control of the station apparatus of an amateur station aboard any vessel or craft that is documented or registered in the United States?
在美国有记录或注册的任何船只或工艺上，谁必须实际控制业余电台的电台设备?

A. Only a person with an FCC Marine Radio license grant ✗
只有获得FCC海洋无线电许可证的人
B. Any person holding an FCC issued amateur license or who is authorized for alien reciprocal operation ✓
任何持有美国联邦通信委员会颁发的业余执照或被授权从事外国互惠业务的人
C. Only a person named in an amateur station license grant ✗
只有一个在业余电台执照授予中被点名的人
D. Any person named in an amateur station license grant or a person holding an unrestricted Radiotelephone Operator Permit ✗
任何在业余电台执照授予中被点名的人或持有不受限制的无线电话操作员许可证的人

E1A14. Except in some parts of Alaska, what is the maximum power permitted on the 630 meter band?
除了阿拉斯加的一些地区，630米波段允许的最大功率是多少?

A. 50 watts PEP ✗
50瓦PEP
B. 100 watts PEP ✗
100瓦PEP
C. 1 watt EIRP ✗
1瓦EIRP
D. 5 watts EIRP ✓
5瓦EIRP

E1B Station restrictions and special operations: restrictions on station location; general operating restrictions; spurious emissions; antenna structure restrictions; RACES operations
车站限制和特殊作业：对车站位置的限制；一般操作限制；杂散发射；天线结构限制；RACES操作

E1B01. Which of the following constitutes a spurious emission?
以下哪项构成杂散发射?

A. An amateur station transmission made without the proper call sign identification ✗
未经正确呼号识别的业余电台传输
B. A signal transmitted to prevent its detection by any station other than the intended recipient ✗
为防止被预期接收者以外的任何电台检测到而发送的信号
C. Any transmitted signal that unintentionally interferes with another licensed radio station ✗
任何无意干扰另一个许可电台的传输信号
D. An emission outside the signal's necessary bandwidth that can be reduced or eliminated without affecting the information transmitted ✓
在信号必要带宽之外的发射，可以在不影响传输信息的情况下减少或消除

E1B02. Which of the following is an acceptable bandwidth for Digital Radio Mondiale (DRM) based voice or SSTV digital transmissions made on the HF amateur bands?
以下哪项是在HF业余频段上进行的基于数字世界广播（DRM）的语音或SSTV数字传输的可接受带宽?

A. 3 kHz ✓
3千赫
B. 10 kHz ✗
10千赫
C. 15 kHz ✗
15千赫
D. 20 kHz ✗
20千赫

E1B03. Within what distance must an amateur station protect an FCC monitoring facility from harmful interference?
业余电台必须在多大距离内保护FCC监控设施免受有害干扰?

A. 1 mile ✓
1英里
B. 3 miles ✗
3英里
C. 10 miles ✗
10英里
D. 30 miles ✗
30英里

E1B04. What must be done before placing an amateur station within an officially designated wilderness area or wildlife preserve, or an area listed in the National Register of Historic Places?
在将业余站点放置在官方指定的荒野区域或野生动物保护区内，或国家历史名胜名录中列出的区域内之前，必须做什么?

A. A proposal must be submitted to the National Park Service ✗
必须向国家公园管理局提交提案
B. A letter of intent must be filed with the Environmental Protection Agency ✗
必须向环境保护局提交意向书
C. An Environmental Assessment must be submitted to the FCC ✓
必须向FCC提交环境评估
D. A form FSD-15 must be submitted to the Department of the Interior ✗
必须向内政部提交FSD-15表格

E1B05. What is the National Radio Quiet Zone?
什么是国家无线电静默区?

A. An area in Puerto Rico surrounding the Arecibo Radio Telescope ✗
阿雷西博射电望远镜周围的波多黎各地区
B. An area in New Mexico surrounding the White Sands Test Area ✗
新墨西哥州白沙试验区周围的一个区域
C. An area surrounding the National Radio Astronomy Observatory ✓
国家射电天文台周围的区域
D. An area in Florida surrounding Cape Canaveral ✗
佛罗里达州卡纳维拉尔角周围的一个地区

E1B06. Which of the following additional rules apply if you are installing an amateur station antenna at a site at or near a public use airport?
如果您在公共机场或附近安装业余电台天线，以下哪些附加规则适用?

A. You may have to notify the Federal Aviation Administration and register it with the FCC as required by Part 17 of the FCC rules ✓
您可能需要通知美国联邦航空管理局，并按照FCC规则第17部分的要求向FCC注册
B. You must submit engineering drawings to the FAA ✗
你必须向FAA提交工程图纸
C. You must file an Environmental Impact Statement with the EPA before construction begins ✗
施工开始前，你必须向环保局提交一份环境影响声明
D. You must obtain a construction permit from the airport zoning authority ✗
你必须从机场分区管理局获得施工许可

E1B07. To what type of regulations does PRB-1 apply?
PRB-1适用于哪种类型的法规?

A. Homeowners associations ✗
房主协会
B. FAA tower height limits ✗
FAA塔架高度限制
C. State and local zoning ✓
州和地方分区
D. Use of wireless devices in vehicles ✗
无线设备在车辆中的使用

E1B08. What limitations may the FCC place on an amateur station if its signal causes interference to domestic broadcast reception, assuming that the receivers involved are of good engineering desig
如果业余电台的信号对国内广播接收造成干扰，假设所涉及的接收器具有良好的工程设计，FCC可能会对其进行哪些限制

A. The amateur station must cease operation ✗
业余电台必须停止运营
B. The amateur station must cease operation on all frequencies below 30 MHz ✗
业余电台必须停止在低于30 MHz的所有频率上运行
C. The amateur station must cease operation on all frequencies above 30 MHz ✗
业余电台必须停止在30 MHz以上的所有频率上运行
D. The amateur station must avoid transmitting during certain hours on frequencies that cause the interference ✓
业余电台必须避免在特定时间内以造成干扰的频率进行发射

E1B09. Which amateur stations may be operated under RACES rules?
哪些业余电台可以根据比赛规则运营?

A. Only those club stations licensed to Amateur Extra Class operators ✗
只有那些授权给业余特级运营商的俱乐部电台
B. Any FCC-licensed amateur station except a Technician Class ✗
除技术员外的任何FCC许可的业余电台
C. Any FCC-licensed amateur station certified by the responsible civil defense organization for the area served ✓
任何经服务地区负责民防组织认证的FCC许可业余电台
D. Any FCC-licensed amateur station participating in the Military Auxiliary Radio System (MARS) ✗
任何参加军事辅助无线电系统（MARS）的FCC许可业余电台

E1B10. What frequencies are authorized to an amateur station operating under RACES rules?
根据RACES规则，业余电台可以使用哪些频率?

A. All amateur service frequencies authorized to the control operator ✓
授权给控制操作员的所有业余服务频率
B. Specific segments in the amateur service MF, HF, VHF and UHF bands ✗
业余服务MF、HF、VHF和UHF频带中的特定段
C. Specific local government channels ✗
具体的地方政府渠道
D. Military Auxiliary Radio System (MARS) channels ✗
军事辅助无线电系统（MARS）信道

E1B11. What does PRB-1 require of regulations affecting amateur radio?
PRB-1对影响业余无线电的法规有什么要求?

A. No limitations may be placed on antenna size or placement ✗
天线尺寸或位置不受限制
B. Reasonable accommodations of amateur radio must be made ✓
必须为业余无线电爱好者提供合理的住宿
C. Amateur radio operations must be permitted in any private residence ✗
任何私人住宅都必须允许业余无线电操作
D. Use of wireless devices in a vehicle is exempt from regulation ✗
在车辆中使用无线设备不受监管

E1B12. What must the control operator of a repeater operating in the 70 cm band do if a radiolocation system experiences interference from that repeater?
如果无线电定位系统受到中继器的干扰，在70厘米波段工作的中继器的控制操作员必须做什么?

A. Cease operation or make changes to the repeater to mitigate the interference ✓
停止操作或更改中继器以减轻干扰
B. File an FAA NOTAM (Notice to Airmen) with the repeater system's ERP, call sign, and six-character grid locator ✗
用中继器系统的ERP、呼号和六字符网格定位器提交FAA NOTAM（飞行员通知）
C. Reduce the repeater antenna HAAT (Height Above Average Terrain) ✗
减小中继器天线HAAT（高度高于平均地形）
D. All these choices are correct ✗
所有这些选择都是正确的

E1C Rules pertaining to automatic and remote control; band-specific regulations; operating in, and communicating with foreign countries; spurious emission standards; HF modulation index limit; bandwidth definition
与自动控制和远程控制有关的规则；波段特定规定；在外国经营并与外国交流；杂散发射标准；HF调制指数限制；带宽定义

E1C01. What is the maximum bandwidth for a data emission on 60 meters?
60米数据发射的最大带宽是多少?

A. 60 Hz ✗
60赫兹
B. 170 Hz ✗
170赫兹
C. 1.5 kHz ✗
1.5千赫
D. 2.8 kHz ✓
2.8千赫

E1C02. Which of the following types of communications may be transmitted to amateur stations in foreign countries?
以下哪种类型的通信可以传输到外国的业余电台?

A. Business-related messages for non-profit organizations ✗
非营利组织的商业相关信息
B. Messages intended for users of the maritime satellite service ✗
发给海事卫星服务用户的信息
C. Communications incidental to the purpose of the amateur service and remarks of a personal nature ✓
业余服务目的附带的通信和个人性质的评论
D. All these choices are correct ✗
所有这些选择都是正确的

E1C03. How do the control operator responsibilities of a station under automatic control differ from one under local control?
自动控制站的控制操作员职责与本地控制站的操作员职责有何不同?

A. Under local control there is no control operator ✗
在本地控制下，没有控制操作员
B. Under automatic control the control operator is not required to be present at the control point ✓
在自动控制下，控制操作员不需要出现在控制点
C. Under automatic control there is no control operator ✗
在自动控制下，没有控制操作员
D. Under local control a control operator is not required to be present at a control point ✗
在本地控制下，控制操作员不需要出现在控制点

E1C04. What is meant by IARP?
IARP是什么意思?

A. An international amateur radio permit that allows U.S. amateurs to operate in certain countries of the Americas ✓
国际业余无线电许可证，允许美国业余爱好者在美洲的某些国家进行操作
B. The internal amateur radio practices policy of the FCC ✗
FCC的内部业余无线电实践政策
C. An indication of increased antenna reflected power ✗
天线反射功率增加的指示
D. A forecast of intermittent aurora radio propagation ✗
间歇性极光无线电传播的预测

E1C05. When may an automatically controlled station originate third party communications?
自动控制站何时可以发起第三方通信?

A. Never ✓
从不
B. Only when transmitting RTTY or data emissions ✗
仅当传输RTTY或数据发射时
C. When agreed upon by the sending or receiving station ✗
当发送站或接收站同意时
D. When approved by the National Telecommunication and Information Administration ✗
经国家电信和信息管理局批准

E1C06. Which of the following is required in order to operate in accordance with CEPT rules in foreign countries where permitted?
在允许的情况下，在外国按照CEPT规则运营需要以下哪一项?

A. You must identify in the official language of the country in which you are operating ✗
您必须用经营所在国家的官方语言进行识别
B. The U.S. embassy must approve of your operation ✗
美国大使馆必须批准你的行动
C. You must bring a copy of FCC Public Notice DA 16-1048 ✓
您必须携带FCC公告DA 16-1048的副本
D. You must append "/CEPT" to your call sign ✗
您必须在呼号后面加上“/CEPT”

E1C07. At what level below a signal's mean power level is its bandwidth determined according to FCC rules?
根据FCC规则，信号的带宽在低于平均功率水平的哪个水平?

A. 3 dB ✗
3分贝
B. 6 dB ✗
6分贝
C. 23 dB ✗
23分贝
D. 26 dB ✓
26分贝

E1C08. What is the maximum permissible duration of a remotely controlled station's transmissions if its control link malfunctions?
如果控制链路发生故障，远程控制站传输的最大允许持续时间是多少?

A. 30 seconds ✗
30秒
B. 3 minutes ✓
3分钟
C. 5 minutes ✗
5分钟
D. 10 minutes ✗
10分钟

E1C09. What is the highest modulation index permitted at the highest modulation frequency for angle modulation below 29.0 MHz?
对于低于29.0 MHz的角度调制，在最高调制频率下允许的最高调制指数是多少?

A. 0.5 ✗
0.5
B. 1 ✓
1
C. 2 ✗
2
D. 3 ✗
3

E1C10. What is the permitted mean power of any spurious emission relative to the mean power of the fundamental emission from a station transmitter or external RF amplifier installed after January 1
相对于1月1日之后安装的电台发射机或外部射频放大器的基本发射的平均功率，任何杂散发射的允许平均功率是多少

A. At least 43 dB below ✓
至少低于43 dB
B. At least 53 dB below ✗
至少低于53 dB
C. At least 63 dB below ✗
至少低于63 dB
D. At least 73 dB below ✗
至少低于73 dB

E1C11. Which of the following operating arrangements allows an FCC-licensed U.S. citizen to operate in many European countries, and alien amateurs from many European countries to operate in the U.S
以下哪项运营安排允许FCC许可的美国公民在许多欧洲国家运营，以及允许来自许多欧洲国家的外国业余爱好者在美国运营

A. CEPT agreement ✓
CEPT协议
B. IARP agreement ✗
IARP协议
C. ITU reciprocal license ✗
ITU互惠许可
D. All these choices are correct ✗
所有这些选择都是正确的

E1C12. On what portion of the 630 meter band are phone emissions permitted?
在630米波段的哪一部分允许手机发射?

A. None ✗
没有一个
B. Only the top 3 kHz ✗
仅顶部3 kHz
C. Only the bottom 3 kHz ✗
仅底部3 kHz
D. The entire band ✓
整个乐队

E1C13. What notifications must be given before transmitting on the 630 meter or 2200 meter bands?
在630米或2200米波段上传输之前，必须发出哪些通知?

A. A special endorsement must be requested from the FCC ✗
必须向FCC申请特殊背书
B. An environmental impact statement must be filed with the Department of the Interior ✗
必须向内政部提交环境影响声明
C. Operators must inform the Utilities Telecom Council of their call sign and coordinates of the station ✓
运营商必须将其呼号和台站坐标通知公用事业电信委员会
D. Operators must inform the FAA of their intent to operate, giving their call sign and distance to the nearest runway ✗
运营商必须告知FAA他们的运营意图，给出他们的呼号和到最近跑道的距离

E1C14. How long must an operator wait after filing a notification with the Utilities Telecom Commission before operating on the 2200 meter or 630 meter band?
运营商在向公用事业电信委员会提交通知后，必须等待多久才能在2200米或630米频段上运营?

A. Operators must not operate until approval is received ✗
操作员在收到批准之前不得操作
B. Operators may operate after 30 days, providing they have not been told that their station is within 1 km of PLC systems using those frequencies ✓
运营商可以在30天后运营，前提是他们没有被告知他们的站点在使用这些频率的PLC系统的1公里范围内
C. Operators may not operate until a test signal has been transmitted in coordination with the local power company ✗
在与当地电力公司协调传输测试信号之前，操作员不得操作
D. Operations may commence immediately, and may continue unless interference is reported by the UTC ✗
操作可以立即开始，并且可以继续，除非UTC报告干扰

E1D Amateur space and Earth stations; telemetry and telecommand rules; identification of balloon transmissions; one-way communications
业余空间站和地球站；遥测和远程通信规则；识别气球传输；单向通信

E1D01. What is the definition of telemetry?
遥测的定义是什么?

A. One-way transmission of measurements at a distance from the measuring instrument ✓
距离测量仪器一定距离的单向测量传输
B. Two-way transmissions in excess of 1000 feet ✗
超过1000英尺的双向变速器
C. Two-way transmissions of data ✗
双向数据传输
D. One-way transmission that initiates, modifies, or terminates the functions of a device at a distance ✗
启动、修改或终止远处设备功能的单向传输

E1D02. Which of the following may transmit special codes intended to obscure the meaning of messages?
以下哪一项可能会传输旨在模糊信息含义的特殊代码?

A. Telecommand signals from a space telecommand station ✓
来自太空遥控站的遥控信号
B. Data containing personal information ✗
包含个人信息的数据
C. Auxiliary relay links carrying repeater audio ✗
携带中继器音频的辅助中继链路
D. Binary control characters ✗
二进制控制字符

E1D03. What is a space telecommand station?
什么是太空远程通信站?

A. An amateur station located on the surface of the Earth for communication with other Earth stations by means of Earth satellites ✗
位于地球表面的业余站，通过地球卫星与其他地球站进行通信
B. An amateur station that transmits communications to initiate, modify or terminate functions of a space station ✓
一种业余空间站，用于发送通信以启动、修改或终止空间站的功能
C. An amateur station located in a satellite or a balloon more than 50 kilometers above the surface of the earth ✗
位于地球表面以上50公里的卫星或气球上的业余空间站
D. An amateur station that receives telemetry from a satellite or balloon more than 50 kilometers above the surface of the earth ✗
从地球表面50多公里以上的卫星或气球接收遥测数据的业余站

E1D04. Which of the following is required in the identification transmissions from a balloon-borne telemetry station?
气球遥测站的识别传输需要以下哪项?

A. Call sign ✓
呼号
B. The output power of the balloon transmitter ✗
气球发射器的输出功率
C. The station's six-character Maidenhead grid locator ✗
台站的六个字符的梅登黑德网格定位器
D. All these choices are correct ✗
所有这些选择都是正确的

E1D05. What must be posted at the station location of a station being operated by telecommand on or within 50 km of the earth's surface?
在地球表面上或距离地球表面50公里以内通过远程通信操作的站点的站点位置必须张贴什么?

A. A photocopy of the station license ✗
电台执照复印件
B. A label with the name, address, and telephone number of the station licensee ✗
带有台站持牌人姓名、地址和电话号码的标签
C. A label with the name, address, and telephone number of the control operator ✗
带有控制操作员姓名、地址和电话号码的标签
D. All these choices are correct ✓
所有这些选择都是正确的

E1D06. What is the maximum permitted transmitter output power when operating a model craft by telecommand?
遥控操作模型飞行器时，允许的最大发射机输出功率是多少?

A. 1 watt ✓
1瓦
B. 2 watts ✗
2瓦
C. 5 watts ✗
5瓦
D. 100 watts ✗
100瓦

E1D07. Which HF amateur bands have frequencies authorized for space stations?
哪些高频业余频段的频率被授权用于空间站?

A. Only the 40, 20, 17, 15, 12, and 10 meter bands ✓
只有40、20、17、15、12和10米波段
B. Only the 40, 20, 17, 15, and 10 meter bands ✗
只有40、20、17、15和10米波段
C. Only the 40, 30, 20, 15, 12, and 10 meter bands ✗
只有40、30、20、15、12和10米波段
D. All HF bands ✗
所有HF波段

E1D08. Which VHF amateur bands have frequencies authorized for space stations?
哪些甚高频业余频段的频率被授权用于空间站?

A. 6 meters and 2 meters ✗
6米和2米
B. 6 meters, 2 meters, and 1.25 meters ✗
6米、2米和1.25米
C. 2 meters and 1.25 meters ✗
2米和1.25米
D. 2 meters ✓
2米

E1D09. Which UHF amateur bands have frequencies authorized for space stations?
哪些超高频业余频段的频率被授权用于空间站?

A. 70 cm only ✗
仅70厘米
B. 70 cm and 13 cm ✓
70厘米和13厘米
C. 70 cm and 33 cm ✗
70厘米和33厘米
D. 33 cm and 13 cm ✗
33厘米和13厘米

E1D10. Which amateur stations are eligible to be telecommand stations of space stations (subject to the privileges of the class of operator license held by the control operator of the station)?
哪些业余空间站有资格成为空间站的远程通信站（受制于空间站控制操作员持有的操作员执照类别的特权）？

A. Any amateur station designated by NASA ✗
美国国家航空航天局指定的任何业余空间站
B. Any amateur station so designated by the space station licensee ✓
空间站持牌人指定的任何业余空间站
C. Any amateur station so designated by the ITU ✗
国际电联如此指定的任何业余电台
D. All these choices are correct ✗
所有这些选择都是正确的

E1D11. Which amateur stations are eligible to operate as Earth stations?
哪些业余台站有资格作为地球台站运行?

A. Any amateur station whose licensee has filed a pre-space notification with the FCC's International Bureau ✗
持牌人已向美国联邦通信委员会国际局提交太空前通知的任何业余电台
B. Only those of General, Advanced or Amateur Extra Class operators ✗
仅适用于普通、高级或业余特级操作员
C. Only those of Amateur Extra Class operators ✗
只有业余特级操作员
D. Any amateur station, subject to the privileges of the class of operator license held by the control operator ✓
任何业余站，受控制操作员持有的操作员执照类别的特权约束

E1D12. Which of the following amateur stations may transmit one-way communications?
以下哪一个业余电台可以传输单向通信?

A. A space station, beacon station, or telecommand station ✓
空间站、信标站或远程通信站
B. A local repeater or linked repeater station ✗
本地中继站或链接中继站
C. A message forwarding station or automatically controlled digital station ✗
消息转发站或自动控制的数字站
D. All these choices are correct ✗
所有这些选择都是正确的

E1E Volunteer examiner program: definitions; qualifications; preparation and administration of exams; accreditation; question pools; documentation requirements
志愿考官计划：定义；资格；考试的准备和管理；认证；问题库；文件要求

E1E01. For which types of out-of-pocket expenses do the Part 97 rules state that VEs and VECs may be reimbursed?
第97部分规则规定VEs和VEC可以报销哪些类型的自付费用?

A. Preparing, processing, administering, and coordinating an examination for an amateur radio operator license ✓
准备、处理、管理和协调业余无线电操作员执照的考试
B. Teaching an amateur operator license examination preparation course ✗
教授业余操作员执照考试准备课程
C. No expenses are authorized for reimbursement ✗
未授权报销任何费用
D. Providing amateur operator license examination preparation training materials ✗
提供业余操作员执照考试准备培训材料

E1E02. Who does Part 97 task with maintaining the pools of questions for all U.S. amateur license examinations?
第97部分的任务是谁维护所有美国业余执照考试的问题库?

A. The VEs ✗
VEs
B. The FCC ✗
FCC
C. The VECs ✓
VEC
D. The ARRL ✗
ARRL

E1E03. What is a Volunteer Examiner Coordinator?
什么是志愿考官协调员?

A. A person who has volunteered to administer amateur operator license examinations ✗
自愿参加业余操作员执照考试的人
B. A person who has volunteered to prepare amateur operator license examinations ✗
自愿准备业余操作员执照考试的人
C. An organization that has entered into an agreement with the FCC to coordinate, prepare, and administer amateur operator license examinations ✓
与联邦通信委员会签订协议，负责协调、准备和管理业余运营商执照考试的组织
D. The person who has entered into an agreement with the FCC to be the VE session manager ✗
与FCC签订协议的人员将担任VE会话经理

E1E04. Which of the following best describes the Volunteer Examiner accreditation process?
以下哪项最能描述志愿考官的认证过程?

A. Each General, Advanced and Amateur Extra Class operator is automatically accredited as a VE when the license is granted ✗
授予许可证后，每个普通、高级和业余特级操作员都会自动获得VE认证
B. The amateur operator applying must pass a VE examination administered by the FCC Enforcement Bureau ✗
申请的业余运营商必须通过FCC执法局管理的VE考试
C. The prospective VE obtains accreditation from the FCC ✗
未来的VE获得了FCC的认证
D. The procedure by which a VEC confirms that the VE applicant meets FCC requirements to serve as an examiner ✓
VEC确认VE申请人符合FCC要求担任审查员的程序

E1E05. What is the minimum passing score on all amateur operator license examinations?
所有业余操作员执照考试的最低及格分数是多少?

A. Minimum passing score of 70% ✗
最低通过分数70%
B. Minimum passing score of 74% ✓
最低通过分数74%
C. Minimum passing score of 80% ✗
最低通过分数为80%
D. Minimum passing score of 77% ✗
最低通过分数77%

E1E06. Who is responsible for the proper conduct and necessary supervision during an amateur operator license examination session?
谁负责业余操作员执照考试期间的适当行为和必要监督?

A. The VEC coordinating the session ✗
VEC协调会议
B. The FCC ✗
FCC
C. Each administering VE ✓
每次服用VE
D. The VE session manager ✗
VE会话经理

E1E07. What should a VE do if a candidate fails to comply with the examiner's instructions during an amateur operator license examination?
如果候选人在业余操作员执照考试中没有遵守考官的指示，VE应该怎么办?

A. Warn the candidate that continued failure to comply will result in termination of the examination ✗
警告考生继续不遵守规定将导致考试终止
B. Immediately terminate the candidate's examination ✓
立即终止考生的考试
C. Allow the candidate to complete the examination, but invalidate the results ✗
允许考生完成考试，但成绩无效
D. Immediately terminate everyone's examination and close the session ✗
立即终止所有人的检查并结束会话

E1E08. To which of the following examinees may a VE not administer an examination?
VE可以不对以下哪一位考生进行考试?

A. Employees of the VE ✗
VE员工
B. Friends of the VE ✗
VE之友
C. Relatives of the VE as listed in the FCC rules ✓
FCC规则中列出的VE亲属
D. All these choices are correct ✗
所有这些选择都是正确的

E1E09. What may be the penalty for a VE who fraudulently administers or certifies an examination?
对于欺诈性地管理或认证考试的VE，可能会受到什么惩罚?

A. Revocation of the VE's amateur station license grant and the suspension of the VE's amateur operator license grant ✓
撤销VE的业余电台许可证授予和暂停VE的业余运营商许可证授予
B. A fine of up to $1000 per occurrence ✗
每次罚款最高1000美元
C. A sentence of up to one year in prison ✗
最高一年监禁
D. All these choices are correct ✗
所有这些选择都是正确的

E1E10. What must the administering VEs do after the administration of a successful examination for an amateur operator license?
在业余操作员执照考试成功后，管理VEs必须做什么?

A. They must collect and send the documents to the NCVEC for grading ✗
他们必须收集文件并将其发送给NCVEC进行评分
B. They must collect and submit the documents to the coordinating VEC for grading ✗
他们必须收集文件并提交给协调VEC进行评分
C. They must submit the application document to the coordinating VEC according to the coordinating VEC instructions ✓
他们必须根据协调VEC的指示向协调VEC提交申请文件
D. They must collect and send the documents to the FCC according to instructions ✗
他们必须根据指示收集文件并将其发送给FCC

E1E11. What must the VE team do if an examinee scores a passing grade on all examination elements needed for an upgrade or new license?
如果考生在升级或新执照所需的所有考试要素上都取得了及格分数，VE团队该怎么办?

A. Photocopy all examination documents and forward them to the FCC for processing ✗
复印所有考试文件并将其转发给FCC进行处理
B. Three VEs must certify that the examinee is qualified for the license grant and that they have complied with the administering VE requirements ✓
三个VE必须证明考生有资格获得许可证，并且他们符合管理VE的要求
C. Issue the examinee the new or upgrade license ✗
为考生颁发新的或升级的执照
D. All these choices are correct ✗
所有这些选择都是正确的

E1E12. What must the VE team do with the application form if the examinee does not pass the exam?
如果考生没有通过考试，VE团队必须如何处理申请表?

A. Return the application document to the examinee ✓
将申请文件退还给考生
B. Maintain the application form with the VEC's records ✗
保存申请表和VEC的记录
C. Send the application form to the FCC and inform the FCC of the grade ✗
将申请表发送给FCC，并告知FCC等级
D. Destroy the application form ✗
销毁申请表

E1F Miscellaneous rules: external RF power amplifiers; prohibited communications; spread spectrum; auxiliary stations; Canadian amateurs operating in the U.S.; special temporary authority; control operator of an auxiliary station
杂项规则：外部射频功率放大器；被禁止的通信；扩频；辅助站；在美国工作的加拿大业余爱好者。；特别临时当局；辅助站的控制操作员

E1F01. On what frequencies are spread spectrum transmissions permitted?
在什么频率上允许扩频传输?

A. Only on amateur frequencies above 50 MHz ✗
仅适用于50 MHz以上的业余频率
B. Only on amateur frequencies above 222 MHz ✓
仅适用于222 MHz以上的业余频率
C. Only on amateur frequencies above 420 MHz ✗
仅适用于420 MHz以上的业余频率
D. Only on amateur frequencies above 144 MHz ✗
仅适用于144 MHz以上的业余频率

E1F02. What privileges are authorized in the U.S. to persons holding an amateur service license granted by the government of Canada?
在美国，持有加拿大政府颁发的业余服务许可证的人有哪些特权?

A. None, they must obtain a U.S. license ✗
没有，他们必须获得美国许可证
B. All privileges of the Amateur Extra Class license ✗
业余特级执照的所有特权
C. The operating terms and conditions of the Canadian amateur service license, not to exceed U.S. Amateur Extra Class license privileges ✓
加拿大业余服务许可证的操作条款和条件，不超过美国业余特级许可证特权
D. Full privileges, up to and including those of the Amateur Extra Class license, on the 80, 40, 20, 15, and 10 meter bands ✗
80米、40米、20米、15米和10米波段的全部特权，包括业余特级执照

E1F03. Under what circumstances may a dealer sell an external RF power amplifier capable of operation below 144 MHz if it has not been granted FCC certification?
如果未获得FCC认证，经销商在什么情况下可以销售能够在144 MHz以下工作的外部RF功率放大器?

A. It was purchased in used condition from an amateur operator and is sold to another amateur operator for use at that operator's station ✓
它是在使用状态下从一名业余运营商处购买的，并出售给另一名业余运营者在该运营商的站点使用
B. The equipment dealer assembled it from a kit ✗
设备经销商用套件组装
C. It was imported from a manufacturer in a country that does not require certification of RF power amplifiers ✗
它是从一个不需要射频功率放大器认证的国家的制造商进口的
D. It was imported from a manufacturer in another country and was certificated by that country's government ✗
它是从另一个国家的制造商那里进口的，并得到了该国政府的认证

E1F04. Which of the following geographic descriptions approximately describes "Line A"?
以下哪个地理描述大致描述了“A线”?

A. A line roughly parallel to and south of the border between the U.S. and Canada ✓
一条大致平行于美国和加拿大边界以南的线
B. A line roughly parallel to and west of the U.S. Atlantic coastline ✗
大致平行于美国大西洋海岸线并位于其西面的一条线
C. A line roughly parallel to and north of the border between the U.S. and Mexico ✗
大致平行于美国和墨西哥边界以北的一条线
D. A line roughly parallel to and east of the U.S. Pacific coastline ✗
大致平行于美国太平洋海岸线并向东的一条线

E1F05. Amateur stations may not transmit in which of the following frequency segments if they are located in the contiguous 48 states and north of Line A?
如果业余电台位于相邻的48个州和A线以北，则可能不会在以下哪个频率段进行传输?

A. 440 MHz - 450 MHz ✗
440兆赫-450兆赫
B. 53 MHz - 54 MHz ✗
53兆赫-54兆赫
C. 222 MHz - 223 MHz ✗
222兆赫-223兆赫
D. 420 MHz - 430 MHz ✓
420兆赫-430兆赫

E1F06. Under what circumstances might the FCC issue a Special Temporary Authority (STA) to an amateur station?
在什么情况下，联邦通信委员会可以向业余电台颁发特别临时管理局（STA）？

A. To provide for experimental amateur communications ✓
提供实验性业余通信
B. To allow regular operation on Land Mobile channels ✗
允许在陆地移动频道上正常运行
C. To provide additional spectrum for personal use ✗
提供额外频谱供个人使用
D. To provide temporary operation while awaiting normal licensing ✗
在等待正常许可证期间提供临时操作

E1F07. When may an amateur station send a message to a business?
业余电台什么时候可以向企业发送消息?

A. When the total money involved does not exceed $25 ✗
当涉及的总金额不超过25美元时
B. When the control operator is employed by the FCC or another government agency ✗
当控制操作员受雇于FCC或其他政府机构时
C. When transmitting international third-party communications ✗
传输国际第三方通信时
D. When neither the amateur nor his or her employer has a pecuniary interest in the communications ✓
当业余爱好者和他的或她的雇主在通信中都没有金钱利益时

E1F08. Which of the following types of amateur station communications are prohibited?
以下哪种类型的业余电台通信是被禁止的?

A. Communications transmitted for hire or material compensation, except as otherwise provided in the rules ✓
为雇佣或物质补偿而传输的通信，除非规则另有规定
B. Communications that have political content, except as allowed by the Fairness Doctrine ✗
具有政治内容的通信，除非公平原则允许
C. Communications that have religious content ✗
具有宗教内容的通信
D. Communications in a language other than English ✗
用英语以外的语言进行交流

E1F09. Which of the following conditions apply when transmitting spread spectrum emissions?
传输扩频发射时，下列哪种条件适用?

A. A station transmitting SS emission must not cause harmful interference to other stations employing other authorized emissions ✗
发射SS发射的电台不得对采用其他授权发射的电台造成有害干扰
B. The transmitting station must be in an area regulated by the FCC or in a country that permits SS emissions ✗
发射站必须位于FCC规定的区域或允许SS排放的国家
C. The transmission must not be used to obscure the meaning of any communication ✗
传输不得用于混淆任何通信的含义
D. All these choices are correct ✓
所有这些选择都是正确的

E1F10. Who may be the control operator of an auxiliary station?
谁可能是辅助站的控制操作员?

A. Any licensed amateur operator ✗
任何有执照的业余操作员
B. Only Technician, General, Advanced or Amateur Extra Class operators ✓
仅限技术员、普通操作员、高级操作员或业余特级操作员
C. Only General, Advanced or Amateur Extra Class operators ✗
仅限普通、高级或业余特级操作员
D. Only Amateur Extra Class operators ✗
仅限业余特级操作员

E1F11. Which of the following best describes one of the standards that must be met by an external RF power amplifier if it is to qualify for a grant of FCC certification?
如果外部射频功率放大器有资格获得FCC认证，以下哪一项最能描述其必须满足的标准?

A. It must produce full legal output when driven by not more than 5 watts of mean RF input power ✗
当由不超过5瓦的平均RF输入功率驱动时，它必须产生完全的合法输出
B. It must be capable of external RF switching between its input and output networks ✗
它必须能够在其输入和输出网络之间进行外部RF切换
C. It must exhibit a gain of 0 dB or less over its full output range ✗
它在整个输出范围内必须表现出0 dB或更小的增益
D. It must satisfy the FCC's spurious emission standards when operated at the lesser of 1500 watts or its full output power ✓
当在1500瓦或其全输出功率中较低的功率下运行时，它必须满足FCC的杂散发射标准

E2 OPERATING PROCEDURES
操作程序

E2A Amateur radio in space: amateur satellites; orbital mechanics; frequencies and modes; satellite hardware; satellite operations
空间业余无线电：业余卫星；轨道力学；频率和模式；卫星硬件；卫星操作

E2A01. What is the direction of an ascending pass for an amateur satellite?
业余卫星上升通道的方向是什么?

A. From west to east ✗
从西向东
B. From east to west ✗
从东向西
C. From south to north ✓
从南到北
D. From north to south ✗
从北向南

E2A02. Which of the following occurs when a satellite is using an inverted linear transponder?
当卫星使用反向线性转发器时，会发生以下哪一种情况?

A. Doppler shift is reduced because the uplink and downlink shifts are in opposite directions ✗
多普勒频移减少，因为上行链路和下行链路的频移方向相反
B. Signal position in the band is reversed ✗
频带中的信号位置颠倒
C. Upper sideband on the uplink becomes lower sideband on the downlink, and vice versa ✗
上行链路上的上边带变为下行链路上的下边带，反之亦然
D. All these choices are correct ✓
所有这些选择都是正确的

E2A03. How is the signal inverted by an inverting linear transponder?
反向线性转发器是如何将信号反向的?

A. The signal is detected and remodulated on the reverse sideband ✗
在反向边带上检测并重新调制信号
B. The signal is passed through a non-linear filter ✗
信号通过非线性滤波器
C. The signal is reduced to I and Q components and the Q component is filtered out ✗
信号被减少为I和Q分量，Q分量被滤除
D. The signal is passed through a mixer and the difference rather than the sum is transmitted ✓
信号通过混频器，并传输差值而不是总和

E2A04. What is meant by the term mode? as applied to an amateur radio satellite?
模式这个术语是什么意思？应用于业余无线电卫星?

A. Whether the satellite is in a low earth or geostationary orbit ✗
卫星是在近地轨道还是地球静止轨道
B. The satellite's uplink and downlink frequency bands ✓
卫星的上行链路和下行链路频带
C. The satellite's orientation with respect to the Earth ✗
卫星相对于地球的方位
D. Whether the satellite is in a polar or equatorial orbit ✗
卫星是在极地轨道还是在赤道轨道

E2A05. What do the letters in a satellite's mode designator specify?
卫星模式指示符中的字母指定了什么?

A. Power limits for uplink and downlink transmissions ✗
上行链路和下行链路传输的功率限制
B. The location of the ground control station ✗
地面控制站的位置
C. The polarization of uplink and downlink signals ✗
上行链路和下行链路信号的极化
D. The uplink and downlink frequency ranges ✓
上行和下行频率范围

E2A06. What are Keplerian elements?
开普勒元素是什么?

A. Parameters that define the orbit of a satellite ✓
定义卫星轨道的参数
B. Phase reversing elements in a Yagi antenna ✗
八木天线中的相位反转元件
C. High-emission heater filaments used in magnetron tubes ✗
用于磁控管的高发射加热器灯丝
D. Encrypting codes used for spread spectrum modulation ✗
用于扩频调制的加密码

E2A07. Which of the following types of signals can be relayed through a linear transponder?
以下哪种类型的信号可以通过线性转发器进行中继?

A. FM and CW ✗
FM和CW
B. SSB and SSTV ✗
SSB和SSTV
C. PSK and packet ✗
PSK和数据包
D. All these choices are correct ✓
所有这些选择都是正确的

E2A08. Why should effective radiated power to a satellite that uses a linear transponder be limited?
为什么使用线性转发器的卫星的有效辐射功率要受到限制?

A. To prevent creating errors in the satellite telemetry ✗
防止在卫星遥测中产生错误
B. To avoid reducing the downlink power to all other users ✓
为避免降低所有其他用户的下行链路功率
C. To prevent the satellite from emitting out-of-band signals ✗
防止卫星发射带外信号
D. To avoid interfering with terrestrial QSOs ✗
避免干扰地面QSO

E2A09. What do the terms L band and S band specify regarding satellite communications?
关于卫星通信，术语L波段和S波段规定了什么?

A. The 23 centimeter and 13 centimeter bands ✓
23厘米和13厘米的带子
B. The 2 meter and 70 centimeter bands ✗
2米和70厘米波段
C. FM and Digital Store-and-Forward systems ✗
调频和数字存储转发系统
D. Which sideband to use ✗
使用哪个边带

E2A10. What type of satellite appears to stay in one position in the sky?
什么类型的卫星似乎停留在天空中的一个位置?

A. HEO ✗
B. Geostationary ✓
地球静止
C. Geomagnetic ✗
地磁
D. LEO ✗

E2A11. What type of antenna can be used to minimize the effects of spin modulation and Faraday rotation?
什么类型的天线可以用来最小化自旋调制和法拉第旋转的影响?

A. A linearly polarized antenna ✗
线性极化天线
B. A circularly polarized antenna ✓
圆极化天线
C. An isotropic antenna ✗
各向同性天线
D. A log-periodic dipole array ✗
对数周期偶极子阵列

E2A12. What is the purpose of digital store-and-forward functions on an amateur radio satellite?
业余无线电卫星上的数字存储和转发功能的目的是什么?

A. To upload operational software for the transponder ✗
上传应答器的操作软件
B. To delay download of telemetry between satellites ✗
延迟卫星间遥测数据的下载
C. To store digital messages in the satellite for later download by other stations ✓
将数字信息存储在卫星中，供其他电台稍后下载
D. To relay messages between satellites ✗
在卫星之间中继消息

E2A13. Which of the following techniques is normally used by low Earth orbiting digital satellites to relay messages around the world?
近地轨道数字卫星通常使用以下哪种技术在世界各地传递信息?

A. Digipeating ✗
数字化
B. Store-and-forward ✓
存储并转发
C. Multi-satellite relaying ✗
多星中继
D. Node hopping ✗
节点跳变

E2B Television practices: fast scan television standards and techniques; slow scan television standards and techniques
电视实践：快速扫描电视标准和技术；慢扫描电视标准与技术

E2B01. How many times per second is a new frame transmitted in a fast-scan (NTSC) television system?
在快速扫描（NTSC）电视系统中，一个新帧每秒传输多少次?

A. 30 ✓
30
B. 60 ✗
60
C. 90 ✗
90
D. 120 ✗
120

E2B02. How many horizontal lines make up a fast-scan (NTSC) television frame?
一个快速扫描（NTSC）电视帧由多少条水平线组成?

A. 30 ✗
30
B. 60 ✗
60
C. 525 ✓
525
D. 1080 ✗
1080

E2B03. How is an interlaced scanning pattern generated in a fast-scan (NTSC) television system?
在快速扫描（NTSC）电视系统中，隔行扫描模式是如何产生的?

A. By scanning two fields simultaneously ✗
通过同时扫描两个场
B. By scanning each field from bottom to top ✗
通过从下至上扫描每个字段
C. By scanning lines from left to right in one field and right to left in the next ✗
通过在一个字段中从左到右扫描行，在下一个字段从右到左扫描行
D. By scanning odd numbered lines in one field and even numbered lines in the next ✓
通过扫描一个场中的奇数行和下一场中的偶数行

E2B04. How is color information sent in analog SSTV?
如何在模拟SSTV中发送颜色信息?

A. Color lines are sent sequentially ✓
颜色行按顺序发送
B. Color information is sent on a 2.8 kHz subcarrier ✗
颜色信息在2.8 kHz的子载波上发送
C. Color is sent in a color burst at the end of each line ✗
颜色在每行末尾的彩色连拍中发送
D. Color is amplitude modulated on the frequency modulated intensity signal ✗
颜色在调频强度信号上进行幅度调制

E2B05. Which of the following describes the use of vestigial sideband in analog fast-scan TV transmissions?
以下哪项描述了残留边带在模拟快速扫描电视传输中的使用?

A. The vestigial sideband carries the audio information ✗
残留边带携带音频信息
B. The vestigial sideband contains chroma information ✗
残留边带包含色度信息
C. Vestigial sideband reduces bandwidth while allowing for simple video detector circuitry ✓
残留边带减少了带宽，同时允许使用简单的视频检测器电路
D. Vestigial sideband provides high frequency emphasis to sharpen the picture ✗
残留边带提供高频强调以锐化图像

E2B06. What is vestigial sideband modulation?
什么是残留边带调制?

A. Amplitude modulation in which one complete sideband and a portion of the other are transmitted ✓
振幅调制，其中一个完整的边带和另一个边带的一部分被传输
B. A type of modulation in which one sideband is inverted ✗
一种边带反转的调制方式
C. Narrow-band FM modulation achieved by filtering one sideband from the audio before frequency modulating the carrier ✗
在对载波进行频率调制之前，通过对音频中的一个边带进行滤波来实现窄带FM调制
D. Spread spectrum modulation achieved by applying FM modulation following single sideband amplitude modulation ✗
采用单边带幅度调制后的调频实现扩频调制

E2B07. What is the name of the signal component that carries color information in NTSC video?
NTSC视频中携带颜色信息的信号分量的名称是什么?

A. Luminance ✗
亮度
B. Chroma ✓
C. Hue ✗
颜色
D. Spectral intensity ✗
光谱强度

E2B08. What technique allows commercial analog TV receivers to be used for fast-scan TV operations on the 70 cm band?
什么技术允许商业模拟电视接收机用于70厘米波段的快速扫描电视操作?

A. Transmitting on channels shared with cable TV ✓
在与有线电视共享的频道上传输
B. Using converted satellite TV dishes ✗
使用转换后的卫星电视碟形天线
C. Transmitting on the abandoned TV channel 2 ✗
在废弃的电视频道2上传输
D. Using USB and demodulating the signal with a computer sound card ✗
使用USB并用计算机声卡解调信号

E2B09. What hardware, other than a receiver with SSB capability and a suitable computer, is needed to decode SSTV using Digital Radio Mondiale (DRM)?
除了具有SSB功能的接收器和合适的计算机之外，还需要什么硬件来使用数字世界广播（DRM）解码SSTV?

A. A special IF converter ✗
一种特殊的中频转换器
B. A special front end limiter ✗
一种特殊的前端限制器
C. A special notch filter to remove synchronization pulses ✗
一种用于去除同步脉冲的特殊陷波滤波器
D. No other hardware is needed ✓
不需要其他硬件

E2B10. What aspect of an analog slow-scan television signal encodes the brightness of the picture?
模拟慢扫描电视信号的哪个方面对画面的亮度进行编码?

A. Tone frequency ✓
音调频率
B. Tone amplitude ✗
音调幅度
C. Sync amplitude ✗
同步幅度
D. Sync frequency ✗
同步频率

E2B11. What is the function of the Vertical Interval Signaling (VIS) code sent as part of an SSTV transmission?
作为SSTV传输的一部分发送的垂直间隔信号（VIS）代码的功能是什么?

A. To lock the color burst oscillator in color SSTV images ✗
在彩色SSTV图像中锁定彩色连拍振荡器
B. To identify the SSTV mode being used ✓
识别正在使用的SSTV模式
C. To provide vertical synchronization ✗
提供垂直同步
D. To identify the call sign of the station transmitting ✗
识别发送电台的呼号

E2B12. What signals SSTV receiving software to begin a new picture line?
什么信号SSTV接收软件开始一个新的图像线?

A. Specific tone frequencies ✓
特定音调频率
B. Elapsed time ✗
运行时间
C. Specific tone amplitudes ✗
特定音调振幅
D. A two-tone signal ✗
双音信号

E2C Operating methods: contest and DX operating; remote operation techniques; Cabrillo format; QSLing; RF network connected systems
操作方法：竞赛和DX操作；远程操作技术；Cabrillo格式；QSLing；射频网络连接系统

E2C01. What indicator is required to be used by U.S.-licensed operators when operating a station via remote control and the remote transmitter is located in the U.S.?
当通过远程控制操作电台并且远程发射机位于美国时，获得美国许可的运营商需要使用什么指示器。？

A. / followed by the USPS two-letter abbreviation for the state in which the remote station is located ✗
/后面是USPS两个字母的缩写，表示远程站所在的州
B. /R# where # is the district of the remote station ✗
/R#，其中#是远程站点的区域
C. / followed by the ARRL Section of the remote station ✗
/然后是远程站的ARRL段
D. No additional indicator is required ✓
不需要额外的指示器

E2C02. Which of the following best describes the term self-spotting? in connection with HF contest operating?
以下哪一项最能描述“自我发现”一词？与HF竞赛运营有关?

A. The often-prohibited practice of posting one's own call sign and frequency on a spotting network ✓
在侦察网络上张贴自己的呼号和频率的做法经常被禁止
B. The acceptable practice of manually posting the call signs of stations on a spotting network ✗
在定位网络上手动张贴台站呼号的可接受做法
C. A manual technique for rapidly zero beating or tuning to a station's frequency before calling that station ✗
一种手动技术，用于在呼叫电台之前快速零拍频或调谐到电台频率
D. An automatic method for rapidly zero beating or tuning to a station's frequency before calling that station ✗
一种在呼叫某个电台之前快速零差拍或调谐到该电台频率的自动方法

E2C03. From which of the following bands is amateur radio contesting generally excluded?
业余无线电比赛通常被排除在以下哪个乐队之外?

A. 30 meters ✓
30米
B. 6 meters ✗
6米
C. 2 meters ✗
2米
D. 33 centimeters ✗
33厘米

E2C04. Which of the following frequencies are sometimes used for amateur radio mesh networks?
以下哪个频率有时用于业余无线电网状网络?

A. HF frequencies where digital communications are permitted ✗
允许数字通信的HF频率
B. Frequencies shared with various unlicensed wireless data services ✓
与各种未经许可的无线数据服务共享的频率
C. Cable TV channels 41 through 43 ✗
有线电视频道41至43
D. The 60 meter band channel centered on 5373 kHz ✗
以5373 kHz为中心的60米波段信道

E2C05. What is the function of a DX QSL Manager?
DX QSL经理的职能是什么?

A. To allocate frequencies for DXpeditions ✗
为DXpedics分配频率的步骤
B. To handle the receiving and sending of confirmation cards for a DX station ✓
处理DX工作站的确认卡的接收和发送
C. To run a net to allow many stations to contact a rare DX station ✗
运行网络以允许多个电台联系一个罕见的DX电台
D. To relay calls to and from a DX station ✗
将呼叫中继到DX工作站和从DX工作站中继呼叫

E2C06. During a VHF/UHF contest, in which band segment would you expect to find the highest level of SSB or CW activity?
在甚高频/超高频比赛中，你希望在哪个波段找到最高水平的单边带或连续波活动?

A. At the top of each band, usually in a segment reserved for contests ✗
在每个乐队的顶部，通常在为比赛保留的片段中
B. In the middle of each band, usually on the national calling frequency ✗
在每个频段的中间，通常在国家呼叫频率上
C. In the weak signal segment of the band, with most of the activity near the calling frequency ✓
在频带的弱信号段，大部分活动接近主叫频率
D. In the middle of the band, usually 25 kHz above the national calling frequency ✗
在频带中间，通常高于国家呼叫频率25 kHz

E2C07. What is the Cabrillo format?
什么是Cabrillo格式?

A. A standard for submission of electronic contest logs ✓
电子竞赛日志提交标准
B. A method of exchanging information during a contest QSO ✗
一种在比赛中交换信息的方法
C. The most common set of contest rules ✗
最常见的比赛规则
D. The rules of order for meetings between contest sponsors ✗
比赛赞助商之间的会议规则

E2C08. Which of the following contacts may be confirmed through the U.S. QSL bureau system?
以下哪些联系人可以通过美国QSL局系统确认?

A. Special event contacts between stations in the U.S. ✗
美国各电视台之间的特殊活动联系。
B. Contacts between a U.S. station and a non-U.S. station ✓
美国电台和非美国电台之间的联系方式
C. Repeater contacts between U.S. club members ✗
美国俱乐部成员之间的中继器联系
D. Contacts using tactical call signs ✗
使用战术呼号的联系人

E2C09. What type of equipment is commonly used to implement an amateur radio mesh network?
什么类型的设备通常用于实现业余无线电网状网络?

A. A 2 meter VHF transceiver with a 1200 baud modem ✗
带1200波特调制解调器的2米VHF收发器
B. An optical cable connection between the USB ports of 2 separate computers ✗
两台独立计算机的USB端口之间的光缆连接
C. A wireless router running custom firmware ✓
运行自定义固件的无线路由器
D. A 440 MHz transceiver with a 9600 baud modem ✗
带9600波特调制解调器的440 MHz收发器

E2C10. Why might a DX station state that they are listening on another frequency?
为什么DX电台会声明他们正在收听另一个频率?

A. Because the DX station may be transmitting on a frequency that is prohibited to some responding stations ✗
因为DX站可能在禁止某些响应站使用的频率上进行传输
B. To separate the calling stations from the DX station ✗
将呼叫站与DX站分开
C. To improve operating efficiency by reducing interference ✗
通过减少干扰来提高运行效率
D. All these choices are correct ✓
所有这些选择都是正确的

E2C11. How should you generally identify your station when attempting to contact a DX station during a contest or in a pileup?
当你在比赛或堆积中试图联系DX电台时，你通常应该如何识别你的电台?

A. Send your full call sign once or twice ✓
发送一到两次完整的呼号
B. Send only the last two letters of your call sign until you make contact ✗
只发送呼号的最后两个字母，直到您取得联系
C. Send your full call sign and grid square ✗
发送完整的呼号和方格
D. Send the call sign of the DX station three times, the words this is,then your call sign three times ✗
发送DX电台的呼号三次，单词this is，然后是您的呼号

E2C12. What technique do individual nodes use to form a mesh network?
单个节点使用什么技术来形成网状网络?

A. Forward error correction and Viterbi codes ✗
前向纠错和维特比码
B. Acting as store-and-forward digipeaters ✗
充当存储和转发digipeater
C. Discovery and link establishment protocols ✓
发现和链路建立协议
D. Custom code plugs for the local trunking systems ✗
本地集群系统的自定义代码插头

E2D Operating methods: VHF and UHF digital modes and procedures; APRS; EME procedures; meteor scatter procedures
操作方法：甚高频和超高频数字模式和程序；APRS；EME程序；流星散射程序

E2D01. Which of the following digital modes is designed for meteor scatter communications?
以下哪种数字模式是为流星散射通信设计的?

A. WSPR ✗
B. MSK144 ✓
C. Hellschreiber ✗
D. APRS ✗

E2D02. Which of the following is a good technique for making meteor scatter contacts?
以下哪项是制作流星散射接触的好技巧?

A. 15-second timed transmission sequences with stations alternating based on location ✗
15秒定时传输序列，站点根据位置交替
B. Use of special digital modes ✗
特殊数字模式的使用
C. Short transmissions with rapidly repeated call signs and signal reports ✗
具有快速重复呼号和信号报告的短传输
D. All these choices are correct ✓
所有这些选择都是正确的

E2D03. Which of the following digital modes is especially useful for EME communications?
以下哪种数字模式对EME通信特别有用?

A. MSK144 ✗
B. PACTOR III ✗
C. Olivia ✗
奥利维亚
D. JT65 ✓

E2D04. What technology is used to track, in real time, balloons carrying amateur radio transmitters?
使用什么技术来实时跟踪携带业余无线电发射机的气球?

A. Ultrasonics ✗
超声波
B. Bandwidth compressed LORAN ✗
带宽压缩LORAN
C. APRS ✓
D. Doppler shift of beacon signals ✗
信标信号的多普勒频移

E2D05. What is one advantage of the JT65 mode?
JT65模式的一个优点是什么?

A. Uses only a 65 Hz bandwidth ✗
仅使用65 Hz带宽
B. The ability to decode signals which have a very low signal-to-noise ratio ✓
解码信噪比非常低的信号的能力
C. Easily copied by ear if necessary ✗
如有必要，可通过耳朵轻松复制
D. Permits fast-scan TV transmissions over narrow bandwidth ✗
允许在窄带宽上进行快速扫描电视传输

E2D06. Which of the following describes a method of establishing EME contacts?
以下哪一项描述了建立EME联系的方法?

A. Time synchronous transmissions alternately from each station ✓
每个站交替进行时间同步传输
B. Storing and forwarding digital messages ✗
存储和转发数字消息
C. Judging optimum transmission times by monitoring beacons reflected from the moon ✗
通过监测月球反射的信标判断最佳传输时间
D. High-speed CW identification to avoid fading ✗
避免衰落的高速连续波识别

E2D07. What digital protocol is used by APRS?
APRS使用什么数字协议?

A. PACTOR ✗
B. 802.11 ✗
802.11
C. AX.25 ✓
D. AMTOR ✗

E2D08. What type of packet frame is used to transmit APRS beacon data?
什么类型的分组帧用于传输APRS信标数据?

A. Unnumbered Information ✓
未编号信息
B. Disconnect ✗
断开
C. Acknowledgement ✗
确认
D. Connect ✗
连接

E2D09. What type of modulation is used for JT65 contacts?
JT65触点使用哪种类型的调制?

A. Multi-tone AFSK ✓
多音AFSK
B. PSK ✗
C. RTTY ✗
D. IEEE 802.11 ✗
ieee802.11

E2D10. How can an APRS station be used to help support a public service communications activity?
如何使用APRS站来帮助支持公共服务通信活动?

A. An APRS station with an emergency medical technician can automatically transmit medical data to the nearest hospital ✗
配备急救医疗技术人员的APRS站可以自动将医疗数据传输到最近的医院
B. APRS stations with General Personnel Scanners can automatically relay the participant numbers and time as they pass the check points ✗
配备普通人员扫描仪的APRS站可以在参与者通过检查点时自动中继参与者编号和时间
C. An APRS station with a Global Positioning System unit can automatically transmit information to show a mobile station's position during the event ✓
带有全球定位系统单元的APRS站可以在活动期间自动发送信息以显示移动站的位置
D. All these choices are correct ✗
所有这些选择都是正确的

E2D11. Which of the following data are used by the APRS network to communicate station location?
APRS网络使用以下哪些数据来通信站点位置?

A. Polar coordinates ✗
极坐标
B. Time and frequency ✗
时间和频率
C. Radio direction finding spectrum analysis ✗
无线电测向频谱分析
D. Latitude and longitude ✓
纬度和经度

E2E Operating methods: operating HF digital modes
操作方法：操作HF数字模式

E2E01. Which of the following types of modulation is common for data emissions below 30 MHz?
以下哪种类型的调制对于低于30 MHz的数据发射是常见的?

A. DTMF tones modulating an FM signal ✗
DTMF音调调制调频信号
B. FSK ✓
C. Pulse modulation ✗
脉冲调制
D. Spread spectrum ✗
扩频

E2E02. What do the letters FEC mean as they relate to digital operation?
字母FEC是什么意思，因为它们与数字操作有关?

A. Forward Error Correction ✓
前向纠错
B. First Error Correction ✗
首次纠错
C. Fatal Error Correction ✗
致命错误更正
D. Final Error Correction ✗
最终误差修正

E2E03. How is the timing of FT4 contacts organized?
FT4联系的时间安排如何?

A. By exchanging ACK/NAK packets ✗
通过交换ACK/NAK数据包
B. Stations take turns on alternate days ✗
台站每隔一天轮流运行
C. Alternating transmissions at 7.5 second intervals ✓
每隔7.5秒交替传输
D. It depends on the lunar phase ✗
这取决于月相

E2E04. What is indicated when one of the ellipses in an FSK crossed-ellipse display suddenly disappears?
当FSK交叉椭圆显示中的一个椭圆突然消失时，会显示什么?

A. Selective fading has occurred ✓
出现选择性衰落
B. One of the signal filters is saturated ✗
其中一个信号滤波器饱和
C. The receiver has drifted 5 kHz from the desired receive frequency ✗
接收器已偏离所需接收频率5 kHz
D. The mark and space signal have been inverted ✗
标记和空格信号已反转

E2E05. Which of these digital modes does not support keyboard-to-keyboard operation?
以下哪种数字模式不支持键盘对键盘操作?

A. PACTOR ✓
B. RTTY ✗
C. PSK31 ✗
D. MFSK ✗

E2E06. What is the most common data rate used for HF packet?
HF数据包最常用的数据速率是多少?

A. 48 baud ✗
48波特
B. 110 baud ✗
110波特
C. 300 baud ✓
300波特
D. 1200 baud ✗
1200波特

E2E07. Which of the following is a possible reason that attempts to initiate contact with a digital station on a clear frequency are unsuccessful?
以下哪一项可能是尝试在畅通频率上启动与数字电台联系失败的原因?

A. Your transmit frequency is incorrect ✗
您的发射频率不正确
B. The protocol version you are using is not supported by the digital station ✗
数字电台不支持您使用的协议版本
C. Another station you are unable to hear is using the frequency ✗
另一个你听不见的电台正在使用该频率
D. All these choices are correct ✓
所有这些选择都是正确的

E2E08. Which of the following HF digital modes can be used to transfer binary files?
以下哪种HF数字模式可用于传输二进制文件?

A. Hellschreiber ✗
B. PACTOR ✓
C. RTTY ✗
D. AMTOR ✗

E2E09. Which of the following HF digital modes uses variable-length coding for bandwidth efficiency?
以下哪种HF数字模式使用可变长度编码来提高带宽效率?

A. RTTY ✗
B. PACTOR ✗
C. MT63 ✗
D. PSK31 ✓

E2E10. Which of these digital modes has the narrowest bandwidth?
以下哪种数字模式的带宽最窄?

A. MFSK16 ✗
B. 170 Hz shift, 45-baud RTTY ✗
170 Hz移位，45波特RTTY
C. PSK31 ✓
D. 300-baud packet ✗
300波特数据包

E2E11. What is the difference between direct FSK and audio FSK?
直接FSK和音频FSK之间的区别是什么?

A. Direct FSK applies the data signal to the transmitter VFO, while AFSK transmits tones via phone ✓
直接FSK将数据信号施加到发射机VFO，而AFSK通过电话发送音调
B. Direct FSK occupies less bandwidth ✗
直接FSK占用的带宽较少
C. Direct FSK can transmit faster baud rates ✗
直接FSK可以传输更快的波特率
D. Only direct FSK can be decoded by computer ✗
计算机只能解码直接FSK

E2E12. How do ALE stations establish contact?
ALE电台如何建立联系?

A. ALE constantly scans a list of frequencies, activating the radio when the designated call sign is received ✓
ALE不断扫描频率列表，当收到指定的呼号时激活无线电
B. ALE radios monitor an internet site for the frequency they are being paged on ✗
ALE无线电监控互联网站点的寻呼频率
C. ALE radios send a constant tone code to establish a frequency for future use ✗
ALE无线电发送一个恒定音调代码，以建立一个频率供将来使用
D. ALE radios activate when they hear their signal echoed by back scatter ✗
ALE无线电在听到反向散射回波信号时激活

E2E13. Which of these digital modes has the fastest data throughput under clear communication conditions?
在清晰的通信条件下，以下哪种数字模式的数据吞吐量最快?

A. AMTOR ✗
B. 170 Hz shift, 45 baud RTTY ✗
170 Hz移位，45波特RTTY
C. PSK31 ✗
D. 300 baud packet ✓
300波特数据包

E3 RADIO WAVE PROPAGATION
无线电波传播

E3A Electromagnetic waves; Earth-Moon-Earth communications; meteor scatter; microwave tropospheric and scatter propagation; aurora propagation; ionospheric propagation changes over the day; circular polarization
电磁波；地球-月球-地球通信；流星散射；微波对流层和散射传播；极光传播；电离层传播在一天中的变化；圆极化

E3A01. What is the approximate maximum separation measured along the surface of the Earth between two stations communicating by EME?
EME通信的两个站之间沿地球表面测量的近似最大间距是多少?

A. 500 miles, if the moon is at perigee ✗
500英里，如果月球在近地点
B. 2000 miles, if the moon is at apogee ✗
2000英里，如果月球在远地点
C. 5000 miles, if the moon is at perigee ✗
5000英里，如果月球在近地点
D. 12,000 miles, if the moon is visible by both stations ✓
12000英里，如果两个站都能看到月球

E3A02. What characterizes libration fading of an EME signal?
电磁辐射信号的平动衰落特征是什么?

A. A slow change in the pitch of the CW signal ✗
CW信号音调的缓慢变化
B. A fluttery irregular fading ✓
飘动的不规则褪色
C. A gradual loss of signal as the sun rises ✗
太阳升起时逐渐失去信号
D. The returning echo is several hertz lower in frequency than the transmitted signal ✗
返回的回波频率比发送的信号低几赫兹

E3A03. When scheduling EME contacts, which of these conditions will generally result in the least path loss?
在调度EME联系人时，以下哪种情况通常会导致最小的路径损耗?

A. When the moon is at perigee ✓
当月亮在近地点时
B. When the moon is full ✗
当月亮圆的时候
C. When the moon is at apogee ✗
当月亮在远地点时
D. When the MUF is above 30 MHz ✗
当MUF高于30 MHz时

E3A04. What do Hepburn maps predict?
赫本地图预测了什么?

A. Sporadic E propagation ✗
零星E传播
B. Locations of auroral reflecting zones ✗
极光反射带的位置
C. Likelihood of rain scatter along cold or warm fronts ✗
降雨沿冷锋或暖锋分散的可能性
D. Probability of tropospheric propagation ✓
对流层传播的概率

E3A05. Tropospheric propagation of microwave signals often occurs in association with what phenomenon?
微波信号的对流层传播经常与什么现象有关?

A. Grayline ✗
灰线
B. Lightning discharges ✗
雷电放电
C. Warm and cold fronts ✓
暖锋和冷锋
D. Sprites and jets ✗
精灵和喷射

E3A06. What might help to restore contact when DX signals become too weak to copy across an entire HF band a few hours after sunset?
当DX信号在日落后几个小时变得太弱而无法在整个HF波段复制时，什么可能有助于恢复联系?

A. Switch to a higher frequency HF band ✗
切换到更高频率的高频带
B. Switch to a lower frequency HF band ✓
切换到低频HF波段
C. Wait 90 minutes or so for the signal degradation to pass ✗
等待90分钟左右，等待信号降级通过
D. Wait 24 hours before attempting another communication on the band ✗
等待24小时，然后尝试在频带上进行另一次通信

E3A07. Atmospheric ducts capable of propagating microwave signals often form over what geographic feature?
能够传播微波信号的大气管道通常在什么地理特征上形成?

A. Mountain ranges ✗
山脉
B. Forests ✗
森林
C. Bodies of water ✓
水体
D. Urban areas ✗
城市地区

E3A08. When a meteor strikes the Earth's atmosphere, a cylindrical region of free electrons is formed at what layer of the ionosphere?
当流星撞击地球大气层时，在电离层的哪个层形成了一个自由电子的圆柱形区域?

A. The E layer ✓
E层
B. The F1 layer ✗
F1层
C. The F2 layer ✗
F2层
D. The D layer ✗
D层

E3A09. Which of the following frequency ranges is most suited for meteor scatter communications?
以下哪个频率范围最适合流星散射通信?

A. 1.8 MHz - 1.9 MHz ✗
1.8兆赫-1.9兆赫
B. 10 MHz - 14 MHz ✗
10 MHz-14 MHz
C. 28 MHz - 148 MHz ✓
28兆赫-148兆赫
D. 220 MHz - 450 MHz ✗
220兆赫-450兆赫

E3A10. Which type of atmospheric structure can create a path for microwave propagation?
哪种类型的大气结构可以为微波传播创造路径?

A. The jet stream ✗
急流
B. Temperature inversion ✓
温度反转
C. Wind shear ✗
风切变
D. Dust devil ✗
尘暴

E3A11. What is a typical range for tropospheric propagation of microwave signals?
微波信号在对流层传播的典型范围是多少?

A. 10 miles to 50 miles ✗
10英里至50英里
B. 100 miles to 300 miles ✓
100英里至300英里
C. 1200 miles ✗
1200英里
D. 2500 miles ✗
2500英里

E3A12. What is the cause of auroral activity?
极光活动的原因是什么?

A. The interaction in the F2 layer between the solar wind and the Van Allen belt ✗
太阳风和范艾伦带之间F2层的相互作用
B. An extreme low-pressure area in the polar regions ✗
极地的一个极端低压区
C. The interaction in the E layer of charged particles from the Sun with the Earth's magnetic field ✓
太阳带电粒子E层与地球磁场的相互作用
D. Meteor showers concentrated in the extreme northern and southern latitudes ✗
流星雨集中在极北和极南纬度地区

E3A13. Which of these emission modes is best for auroral propagation?
以下哪种发射模式最适合极光传播?

A. CW ✓
B. SSB ✗
C. FM ✗
D. RTTY ✗

E3A14. What is meant by circularly polarized electromagnetic waves?
圆极化电磁波是什么意思?

A. Waves with an electric field bent into a circular shape ✗
电场弯曲成圆形的波
B. Waves with a rotating electric field ✓
具有旋转电场的波
C. Waves that circle the Earth ✗
环绕地球的波浪
D. Waves produced by a loop antenna ✗
环形天线产生的波

E3B Transequatorial propagation; long-path; grayline; ordinary and extraordinary waves; chordal hop; sporadic E mechanisms
跨赤道传播；路径长；灰线；平凡和非凡的波浪；弦跳；偶发性E机制

E3B01. What is transequatorial propagation?
什么是跨赤道传播?

A. Propagation between two mid-latitude points at approximately the same distance north and south of the magnetic equator ✓
磁赤道南北距离大致相同的两个中纬度点之间的传播
B. Propagation between points located on the magnetic equator ✗
位于磁赤道上的点之间的传播
C. Propagation between a point on the equator and its antipodal point ✗
赤道上一点与其对点之间的传播
D. Propagation between points at the same latitude ✗
同一纬度点之间的传播

E3B02. What is the approximate maximum range for signals using transequatorial propagation?
使用跨赤道传播的信号的近似最大范围是多少?

A. 1000 miles ✗
1000英里
B. 2500 miles ✗
2500英里
C. 5000 miles ✓
5000英里
D. 7500 miles ✗
7500英里

E3B03. What is the best time of day for transequatorial propagation?
一天中跨赤道传播的最佳时间是什么?

A. Morning ✗
早晨
B. Noon ✗
正午
C. Afternoon or early evening ✓
下午或傍晚
D. Late at night ✗
深夜

E3B04. What is meant by the terms "extraordinary" and "ordinary" waves?
“非同寻常”和“普通”波浪是什么意思?

A. Extraordinary waves describe rare long-skip propagation compared to ordinary waves, which travel shorter distances ✗
与传播距离较短的普通波相比，特殊波描述了罕见的长跳传播
B. Independent waves created in the ionosphere that are elliptically polarized ✓
电离层中产生的椭圆偏振的独立波
C. Long-path and short-path waves ✗
长程波和短程波
D. Refracted rays and reflected waves ✗
折射光线和反射波

E3B05. Which amateur bands typically support long-path propagation?
哪些业余波段通常支持长路径传播?

A. Only 160 meters to 40 meters ✗
只有160米到40米
B. Only 30 meters to 10 meters ✗
只有30米到10米
C. 160 meters to 10 meters ✓
160米至10米
D. 6 meters to 2 meters ✗
6米至2米

E3B06. Which of the following amateur bands most frequently provides long-path propagation?
以下哪一个业余波段最常提供长路径传播?

A. 80 meters ✗
80米
B. 20 meters ✓
20米
C. 10 meters ✗
10米
D. 6 meters ✗
6米

E3B07. What happens to linearly polarized radio waves that split into ordinary and extraordinary waves in the ionosphere?
线性极化无线电波在电离层中分裂成普通波和非常波会发生什么?

A. They are bent toward the magnetic poles ✗
它们向磁极弯曲
B. They become depolarized ✗
它们变得去极化
C. They become elliptically polarized ✓
它们变成椭圆极化
D. They become phase locked ✗
它们变成相位锁定

E3B08. What is the term for the long path opening that exists between two points on the Earth which are simultaneously near sunrise and sunset?
地球上同时接近日出和日落的两点之间存在的长路径开放的术语是什么?

A. Transequatorial ✗
跨赤道
B. Sporadic E ✗
零星E
C. Long-path ✗
长路径
D. Grayline ✓
灰线

E3B09. At what time of year is sporadic E propagation most likely to occur?
一年中的什么时候最有可能发生零星的E传播?

A. Around the solstices, especially the summer solstice ✓
至日前后，尤其是夏至
B. Around the solstices, especially the winter solstice ✗
冬至前后，尤其是冬至
C. Around the equinoxes, especially the spring equinox ✗
春分前后，尤其是春分
D. Around the equinoxes, especially the fall equinox ✗
春分前后，尤其是秋分

E3B10. Why is chordal hop propagation desirable?
为什么弦跳传播是可取的?

A. The signal experiences less loss compared to multi-hop using Earth as a reflector ✓
与使用地球作为反射器的多跳相比，该信号的损耗更小
B. The MUF for chordal hop propagation is much lower than for normal skip propagation ✗
弦跳传播的MUF比正常跳跃传播低得多
C. Atmospheric noise is lower in the direction of chordal hop propagation ✗
弦跳传播方向的大气噪声较低
D. Signals travel faster along ionospheric chords ✗
信号沿电离层弦传播得更快

E3B11. At what time of day can sporadic E propagation occur?
一天中的什么时候可以发生零星的E传播?

A. Only around sunset ✗
仅在日落前后
B. Only around sunset and sunrise ✗
仅在日落和日出前后
C. Only in hours of darkness ✗
只有在黑暗的时候
D. Any time ✓
任何时候

E3B12. What is the primary characteristic of chordal hop propagation?
弦跳传播的主要特征是什么?

A. Propagation away from the great circle bearing between stations ✗
远离大圆轴承的传播
B. Successive ionospheric refractions without an intermediate reflection from the ground ✓
无地面中间反射的连续电离层折射
C. Propagation across the geomagnetic equator ✗
地磁赤道上的传播
D. Signals reflected back toward the transmitting station ✗
反射回发射站的信号

E3C Radio horizon; ground wave; propagation prediction techniques and modeling; effects of space weather parameters on propagation
无线电地平线；地波；传播预测技术和建模；空间天气参数对传播的影响

E3C01. What does the radio communication term "ray tracing" describe?
无线电通信术语“射线追踪”描述了什么?

A. The process in which an electronic display presents a pattern ✗
电子显示器呈现图案的过程
B. Modeling a radio wave's path through the ionosphere ✓
模拟无线电波穿过电离层的路径
C. Determining the radiation pattern from an array of antennas ✗
确定天线阵列的辐射方向图
D. Evaluating high voltage sources for x-rays ✗
评估x射线高压源

E3C02. What is indicated by a rising A or K index?
a或K指数的上升表明了什么?

A. Increasing disruption of the geomagnetic field ✓
地磁场破坏加剧
B. Decreasing disruption of the geomagnetic field ✗
减少地磁场的破坏
C. Higher levels of solar UV radiation ✗
更高水平的太阳紫外线辐射
D. An increase in the critical frequency ✗
临界频率的增加

E3C03. Which of the following signal paths is most likely to experience high levels of absorption when the A index or K index is elevated?
当A指数或K指数升高时，以下哪种信号路径最有可能经历高水平的吸收?

A. Transequatorial ✗
跨赤道
B. Polar ✓
极地的
C. Sporadic E ✗
零星E
D. NVIS ✗

E3C04. What does the value of Bz (B sub Z) represent?
Bz（B sub Z）的值代表什么?

A. Geomagnetic field stability ✗
地磁场稳定性
B. Critical frequency for vertical transmissions ✗
垂直传输的临界频率
C. Direction and strength of the interplanetary magnetic field ✓
行星际磁场的方向和强度
D. Duration of long-delayed echoes ✗
长延迟回波的持续时间

E3C05. What orientation of Bz (B sub z) increases the likelihood that incoming particles from the sun will cause disturbed conditions?
Bz（B sub z）的哪个方向增加了来自太阳的入射粒子导致扰动条件的可能性?

A. Southward ✓
向南
B. Northward ✗
向北
C. Eastward ✗
向东
D. Westward ✗
向西

E3C06. By how much does the VHF/UHF radio horizon distance exceed the geometric horizon?
甚高频/超高频无线电地平线距离超过几何地平线多少?

A. By approximately 15 percent of the distance ✓
距离的大约15%
B. By approximately twice the distance ✗
大约两倍的距离
C. By approximately 50 percent of the distance ✗
大约50%的距离
D. By approximately four times the distance ✗
大约四倍的距离

E3C07. Which of the following descriptors indicates the greatest solar flare intensity?
以下哪个描述符表示太阳耀斑强度最大?

A. Class A ✗
A类
B. Class B ✗
B类
C. Class M ✗
M级
D. Class X ✓
X类

E3C08. What does the space weather term G5 mean?
空间气象术语G5是什么意思?

A. An extreme geomagnetic storm ✓
一场极端地磁风暴
B. Very low solar activity ✗
太阳活动极低
C. Moderate solar wind ✗
中等太阳风
D. Waning sunspot numbers ✗
Waning太阳黑子数

E3C09. How does the intensity of an X3 flare compare to that of an X2 flare?
X3耀斑的强度与X2耀斑的强度相比如何?

A. 10 percent greater ✗
10%以上
B. 50 percent greater ✓
50%以上
C. Twice as great ✗
两倍大
D. Four times as great ✗
是它的四倍

E3C10. What does the 304A solar parameter measure?
304A太阳能参数测量值是多少?

A. The ratio of x-ray flux to radio flux, correlated to sunspot number ✗
与太阳黑子数量相关的x射线通量与无线电通量的比率
B. UV emissions at 304 angstroms, correlated to the solar flux index ✓
304埃的紫外线辐射，与太阳通量指数相关
C. The solar wind velocity at 304 degrees from the solar equator, correlated to solar activity ✗
距离太阳赤道304度的太阳风速，与太阳活动相关
D. The solar emission at 304 GHz, correlated to x-ray flare levels ✗
304GHz的太阳辐射，与x射线耀斑水平相关

E3C11. What does VOACAP software model?
VOACAP软件模型是什么?

A. AC voltage and impedance ✗
交流电压和阻抗
B. VHF radio propagation ✗
甚高频无线电传播
C. HF propagation ✓
HF传播
D. AC current and impedance ✗
交流电流和阻抗

E3C12. How does the maximum range of ground-wave propagation change when the signal frequency is increased?
当信号频率增加时，地波传播的最大范围如何变化?

A. It stays the same ✗
它保持不变
B. It increases ✗
它会增加
C. It decreases ✓
它减少
D. It peaks at roughly 14 MHz ✗
它的峰值大约为14MHz

E3C13. What type of polarization is best for ground-wave propagation?
什么类型的极化最适合地波传播?

A. Vertical ✓
竖的
B. Horizontal ✗
水平的
C. Circular ✗
圆形的
D. Elliptical ✗
椭圆形

E3C14. Why does the radio-path horizon distance exceed the geometric horizon?
为什么无线电路径地平线距离超过几何地平线?

A. E-region skip ✗
E区域跳过
B. D-region skip ✗
D区域跳过
C. Due to the Doppler effect ✗
由于多普勒效应
D. Downward bending due to density variations in the atmosphere ✓
大气密度变化引起的向下弯曲

E3C15. What might be indicated by a sudden rise in radio background noise across a large portion of the HF spectrum?
在高频频谱的很大一部分中，无线电背景噪声的突然上升可能表明什么?

A. A temperature inversion has occurred ✗
出现温度反转
B. A solar flare has occurred ✓
太阳耀斑已经发生
C. Increased transequatorial propagation is likely ✗
跨赤道传播可能增加
D. Long-path propagation is likely ✗
可能存在长路径传播

E4 AMATEUR PRACTICES
业余练习

E4A Test equipment: analog and digital instruments; spectrum analyzers; antenna analyzers; oscilloscopes; RF measurements; computer-aided measurements
测试设备：模拟和数字仪器；频谱分析仪；天线分析仪；示波器；射频测量；计算机辅助测量

E4A01. Which of the following limits the highest frequency signal that can be accurately displayed on a digital oscilloscope?
以下哪项限制了可以在数字示波器上准确显示的最高频率信号?

A. Sampling rate of the analog-to-digital converter ✓
模数转换器的采样率
B. Amount of memory ✗
内存量
C. Q of the circuit ✗
电路的Q
D. All these choices are correct ✗
所有这些选择都是正确的

E4A02. Which of the following parameters does a spectrum analyzer display on the vertical and horizontal axes?
频谱分析仪在垂直轴和水平轴上显示以下哪个参数?

A. RF amplitude and time ✗
射频幅度和时间
B. RF amplitude and frequency ✓
射频振幅和频率
C. SWR and frequency ✗
SWR和频率
D. SWR and time ✗
SWR和时间

E4A03. Which of the following test instruments is used to display spurious signals and/or intermodulation distortion products generated by an SSB transmitter?
以下哪种测试仪器用于显示SSB发射机产生的杂散信号和/或互调失真产物?

A. A wattmeter ✗
瓦特计
B. A spectrum analyzer ✓
频谱分析仪
C. A logic analyzer ✗
逻辑分析器
D. A time-domain reflectometer ✗
时域反射计

E4A04. How is the compensation of an oscilloscope probe typically adjusted?
示波器探头的补偿通常是如何调整的?

A. A square wave is displayed and the probe is adjusted until the horizontal portions of the displayed wave are as nearly flat as possible ✓
显示方波并调整探头，直到显示的波的水平部分尽可能接近平坦
B. A high frequency sine wave is displayed and the probe is adjusted for maximum amplitude ✗
显示高频正弦波，并调整探头的最大振幅
C. A frequency standard is displayed and the probe is adjusted until the deflection time is accurate ✗
显示频率标准并调整探头，直到偏转时间准确为止
D. A DC voltage standard is displayed and the probe is adjusted until the displayed voltage is accurate ✗
显示直流电压标准，并调整探头，直到显示的电压准确为止

E4A05. What is the purpose of the prescaler function on a frequency counter?
频率计数器上的预分频器功能的用途是什么?

A. It amplifies low-level signals for more accurate counting ✗
它放大低电平信号以实现更精确的计数
B. It multiplies a higher frequency signal so a low-frequency counter can display the operating frequency ✗
它将较高频率的信号相乘，以便低频计数器可以显示工作频率
C. It prevents oscillation in a low-frequency counter circuit ✗
它可以防止低频计数器电路中的振荡
D. It divides a higher frequency signal so a low-frequency counter can display the input frequency ✓
它对较高频率的信号进行分频，以便低频计数器可以显示输入频率

E4A06. What is the effect of aliasing on a digital oscilloscope caused by setting the time base too slow?
由于时基设置太慢，数字示波器上的混叠会产生什么影响?

A. A false, jittery low-frequency version of the signal is displayed ✓
显示虚假、抖动的低频信号
B. All signals will have a DC offset ✗
所有信号都将具有直流偏移
C. Calibration of the vertical scale is no longer valid ✗
垂直刻度的校准不再有效
D. Excessive blanking occurs, which prevents display of the signal ✗
出现过多的消隐，从而阻止信号的显示

E4A07. Which of the following is an advantage of using an antenna analyzer compared to an SWR bridge to measure antenna SWR?
与SWR电桥相比，以下哪项是使用天线分析仪测量天线SWR的优势?

A. Antenna analyzers automatically tune your antenna for resonance ✗
天线分析仪可自动调整天线以产生谐振
B. Antenna analyzers do not need an external RF source ✓
天线分析仪不需要外部射频源
C. Antenna analyzers display a time-varying representation of the modulation envelope ✗
天线分析仪显示调制包络的时变表示
D. All these choices are correct ✗
所有这些选择都是正确的

E4A08. Which of the following measures SWR?
以下哪项衡量SWR?

A. A spectrum analyzer ✗
频谱分析仪
B. A Q meter ✗
Q计
C. An ohmmeter ✗
欧姆表
D. An antenna analyzer ✓
天线分析仪

E4A09. Which of the following is good practice when using an oscilloscope probe?
使用示波器探头时，以下哪项是良好的做法?

A. Keep the signal ground connection of the probe as short as possible ✓
保持探针的信号接地连接尽可能短
B. Never use a high-impedance probe to measure a low-impedance circuit ✗
切勿使用高阻抗探针测量低阻抗电路
C. Never use a DC-coupled probe to measure an AC circuit ✗
切勿使用直流耦合探针测量交流电路
D. All these choices are correct ✗
所有这些选择都是正确的

E4A10. Which of the following displays multiple digital signal states simultaneously?
以下哪项同时显示多个数字信号状态?

A. Network analyzer ✗
网络分析仪
B. Bit error rate tester ✗
误码率测试仪
C. Modulation monitor ✗
调制监视器
D. Logic analyzer ✓
逻辑分析仪

E4A11. How should an antenna analyzer be connected when measuring antenna resonance and feed point impedance?
测量天线谐振和馈电点阻抗时，应如何连接天线分析仪?

A. Loosely couple the analyzer near the antenna base ✗
将分析仪松散地耦合到天线底座附近
B. Connect the analyzer via a high-impedance transformer to the antenna ✗
通过高阻抗变压器将分析仪连接到天线
C. Loosely couple the antenna and a dummy load to the analyzer ✗
将天线和模拟负载松散耦合到分析仪
D. Connect the antenna feed line directly to the analyzer's connector ✓
将天线馈线直接连接到分析仪的接头上

E4B Measurement technique and limitations: instrument accuracy and performance limitations; probes; techniques to minimize errors; measurement of Q; instrument calibration; S parameters; vector network analyzers
测量技术和限制：仪器精度和性能限制；探针；尽量减少误差的技术；Q的测量；仪器校准；S参数；矢量网络分析仪

E4B01. Which of the following factors most affects the accuracy of a frequency counter?
以下哪个因素对频率计数器的精度影响最大?

A. Input attenuator accuracy ✗
输入衰减器精度
B. Time base accuracy ✓
时基精度
C. Decade divider accuracy ✗
十进制除法器精度
D. Temperature coefficient of the logic ✗
逻辑的温度系数

E4B02. What is the significance of voltmeter sensitivity expressed in ohms per volt?
以欧姆/伏特表示的电压表灵敏度的意义是什么?

A. The full scale reading of the voltmeter multiplied by its ohms per volt rating will indicate the input impedance of the voltmeter ✓
电压表的满刻度读数乘以每伏额定值的欧姆将指示电压表的输入阻抗
B. When used as a galvanometer, the reading in volts multiplied by the ohms per volt rating will determine the power drawn by the device under test ✗
当用作电流计时，以伏特为单位的读数乘以每伏特额定值的欧姆将决定被测设备的功率
C. When used as an ohmmeter, the reading in ohms divided by the ohms per volt rating will determine the voltage applied to the circuit ✗
当用作欧姆表时，以欧姆为单位的读数除以每伏额定值的欧姆将决定施加在电路上的电压
D. When used as an ammeter, the full scale reading in amps divided by ohms per volt rating will determine the size of shunt needed ✗
当用作电流表时，以安培为单位的满刻度读数除以每伏额定值的欧姆将决定所需分流器的大小

E4B03. Which S parameter is equivalent to forward gain?
哪个S参数等效于正向增益?

A. S11 ✗
B. S12 ✗
C. S21 ✓
D. S22 ✗

E4B04. Which S parameter represents input port return loss or reflection coefficient (equivalent to VSWR)?
哪个S参数表示输入端口回波损耗或反射系数（相当于VSWR）?

A. S11 ✓
B. S12 ✗
C. S21 ✗
D. S22 ✗

E4B05. What three test loads are used to calibrate an RF vector network analyzer?
哪三种测试负载用于校准RF矢量网络分析仪?

A. 50 ohms, 75 ohms, and 90 ohms ✗
50欧姆、75欧姆和90欧姆
B. Short circuit, open circuit, and 50 ohms ✓
短路、断路和50欧姆
C. Short circuit, open circuit, and resonant circuit ✗
短路、断路和谐振电路
D. 50 ohms through 1/8 wavelength, 1/4 wavelength, and 1/2 wavelength of coaxial cable ✗
50欧姆至1/8波长、1/4波长和1/2波长的同轴电缆

E4B06. How much power is being absorbed by the load when a directional power meter connected between a transmitter and a terminating load reads 100 watts forward power and 25 watts reflected power?
当连接在发射机和终端负载之间的定向功率计读取100瓦正向功率和25瓦反射功率时，负载吸收了多少功率?

A. 100 watts ✗
100瓦
B. 125 watts ✗
125瓦
C. 25 watts ✗
25瓦
D. 75 watts ✓
75瓦

E4B07. What do the subscripts of S parameters represent?
S参数的下标代表什么?

A. The port or ports at which measurements are made ✓
进行测量的端口
B. The relative time between measurements ✗
测量之间的相对时间
C. Relative quality of the data ✗
数据的相对质量
D. Frequency order of the measurements ✗
测量的频率顺序

E4B08. Which of the following can be used to measure the Q of a series-tuned circuit?
以下哪项可用于测量串联调谐电路的Q?

A. The inductance to capacitance ratio ✗
电感电容比
B. The frequency shift ✗
频率偏移
C. The bandwidth of the circuit's frequency response ✓
电路频率响应的带宽
D. The resonant frequency of the circuit ✗
电路的谐振频率

E4B09. What is indicated if the current reading on an RF ammeter placed in series with the antenna feed line of a transmitter increases as the transmitter is tuned to resonance?
如果与发射器的天线馈线串联的RF安培计上的电流读数随着发射器调谐到谐振而增加，会显示什么?

A. There is possibly a short to ground in the feed line ✗
馈线中可能存在对地短路
B. The transmitter is not properly neutralized ✗
变送器未正确中和
C. There is an impedance mismatch between the antenna and feed line ✗
天线和馈线之间存在阻抗不匹配
D. There is more power going into the antenna ✓
有更多的电力进入天线

E4B10. Which of the following methods measures intermodulation distortion in an SSB transmitter?
以下哪种方法测量SSB发射机中的互调失真?

A. Modulate the transmitter using two RF signals having non-harmonically related frequencies and observe the RF output with a spectrum analyzer ✗
使用具有非谐波相关频率的两个RF信号调制发射器，并使用频谱分析仪观察RF输出
B. Modulate the transmitter using two AF signals having non-harmonically related frequencies and observe the RF output with a spectrum analyzer ✓
使用具有非谐波相关频率的两个AF信号调制发射器，并使用频谱分析仪观察RF输出
C. Modulate the transmitter using two AF signals having harmonically related frequencies and observe the RF output with a peak reading wattmeter ✗
使用具有谐波相关频率的两个AF信号调制发射器，并使用峰值读数瓦特计观察RF输出
D. Modulate the transmitter using two RF signals having harmonically related frequencies and observe the RF output with a logic analyzer ✗
使用具有谐波相关频率的两个RF信号调制发射器，并用逻辑分析仪观察RF输出

E4B11. Which of the following can be measured with a vector network analyzer?
以下哪项可以用矢量网络分析仪进行测量?

A. Input impedance ✗
输入阻抗
B. Output impedance ✗
输出阻抗
C. Reflection coefficient ✗
反射系数
D. All these choices are correct ✓
所有这些选择都是正确的

E4C Receiver performance characteristics: phase noise, noise floor, image rejection, MDS, signal-to-noise ratio, noise figure, reciprocal mixing; selectivity; effects of SDR receiver non-linearity; use of attenuators at low frequencies
接收机性能特点：相位噪声、本底噪声、图像抑制、MDS、信噪比、噪声系数、互易混频；选择性；SDR接收机非线性的影响；低频衰减器的使用

E4C01. What is an effect of excessive phase noise in a receiver's local oscillator?
接收器的本地振荡器中过多的相位噪声的影响是什么?

A. It limits the receiver's ability to receive strong signals ✗
它限制了接收器接收强信号的能力
B. It can affect the receiver's frequency calibration ✗
它会影响接收器的频率校准
C. It decreases receiver third-order intercept point ✗
它降低了接收器的三阶截点
D. It can combine with strong signals on nearby frequencies to generate interference ✓
它可以与附近频率上的强信号结合产生干扰

E4C02. Which of the following receiver circuits can be effective in eliminating interference from strong out-of-band signals?
以下哪种接收器电路可以有效地消除强带外信号的干扰?

A. A front-end filter or pre-selector ✓
前端过滤器或预选器
B. A narrow IF filter ✗
窄中频滤波器
C. A notch filter ✗
陷波滤波器
D. A properly adjusted product detector ✗
经过适当调整的产品检测器

E4C03. What is the term for the suppression in an FM receiver of one signal by another stronger signal on the same frequency?
在调频接收机中，一个信号被同一频率上的另一个更强信号抑制的术语是什么?

A. Desensitization ✗
脱敏作用
B. Cross-modulation interference ✗
交叉调制干扰
C. Capture effect ✓
捕获效果
D. Frequency discrimination ✗
频率辨别

E4C04. What is the noise figure of a receiver?
接收器的噪声系数是多少?

A. The ratio of atmospheric noise to phase noise ✗
大气噪声与相位噪声之比
B. The ratio of the noise bandwidth in hertz to the theoretical bandwidth of a resistive network ✗
以赫兹为单位的噪声带宽与电阻网络的理论带宽之比
C. The ratio of thermal noise to atmospheric noise ✗
热噪声与大气噪声之比
D. The ratio in dB of the noise generated by the receiver to the theoretical minimum noise ✓
接收器产生的噪声与理论最小噪声之比（dB）

E4C05. What does a receiver noise floor of -174 dBm represent?
-174dBm的接收机本底噪声代表什么?

A. The minimum detectable signal as a function of receive frequency ✗
作为接收频率函数的最小可检测信号
B. The theoretical noise in a 1 Hz bandwidth at the input of a perfect receiver at room temperature ✓
室温下理想接收器输入端1 Hz带宽的理论噪声
C. The noise figure of a 1 Hz bandwidth receiver ✗
1 Hz带宽接收机的噪声系数
D. The galactic noise contribution to minimum detectable signal ✗
星系噪声对最小可探测信号的贡献

E4C06. A CW receiver with the AGC off has an equivalent input noise power density of -174 dBm/Hz. What would be the level of an unmodulated carrier input to this receiver that would yield an audio
AGC关闭的CW接收机具有-174dBm/Hz的等效输入噪声功率密度。输入到该接收器的未调制载波的电平将产生音频

A. -174 dBm ✗
B. -164 dBm ✗
C. -155 dBm ✗
D. -148 dBm ✓

E4C07. What does the MDS of a receiver represent?
接收器的MDS代表什么?

A. The meter display sensitivity ✗
仪表显示灵敏度
B. The minimum discernible signal ✓
最小可辨别信号
C. The multiplex distortion stability ✗
多路失真稳定性
D. The maximum detectable spectrum ✗
最大可检测光谱

E4C08. An SDR receiver is overloaded when input signals exceed what level?
当输入信号超过什么水平时，SDR接收器过载?

A. One-half the maximum sample rate ✗
最大采样率的一半
B. One-half the maximum sampling buffer size ✗
最大采样缓冲区大小的一半
C. The maximum count value of the analog-to-digital converter ✗
模数转换器的最大计数值
D. The reference voltage of the analog-to-digital converter ✓
模数转换器的参考电压

E4C09. Which of the following choices is a good reason for selecting a high frequency for the design of the IF in a superheterodyne HF or VHF communications receiver?
以下哪一项选择是为超外差HF或VHF通信接收机中的IF设计选择高频的充分理由?

A. Fewer components in the receiver ✗
接收器中的组件较少
B. Reduced drift ✗
减少漂移
C. Easier for front-end circuitry to eliminate image responses ✓
前端电路更容易消除图像响应
D. Improved receiver noise figure ✗
改进的接收器噪声系数

E4C10. What is an advantage of having a variety of receiver IF bandwidths from which to select?
有多种接收机中频带宽可供选择的优点是什么?

A. The noise figure of the RF amplifier can be adjusted to match the modulation type, thus increasing receiver sensitivity ✗
可以调整射频放大器的噪声系数以匹配调制类型，从而提高接收器的灵敏度
B. Receiver power consumption can be reduced when wider bandwidth is not required ✗
当不需要更宽的带宽时，可以降低接收器功耗
C. Receive bandwidth can be set to match the modulation bandwidth, maximizing signal-to-noise ratio and minimizing interference ✓
接收带宽可以设置为与调制带宽匹配，最大限度地提高信噪比并最大限度地减少干扰
D. Multiple frequencies can be received simultaneously if desired ✗
如果需要，可以同时接收多个频率

E4C11. Why can an attenuator be used to reduce receiver overload on the lower frequency HF bands with little or no impact on signal-to-noise ratio?
为什么可以使用衰减器来减少低频HF频带上的接收器过载，而对信噪比几乎没有影响?

A. The attenuator has a low-pass filter to increase the strength of lower frequency signals ✗
衰减器有一个低通滤波器，以增加低频信号的强度
B. The attenuator has a noise filter to suppress interference ✗
衰减器有一个噪声滤波器来抑制干扰
C. Signals are attenuated separately from the noise ✗
信号与噪声分开衰减
D. Atmospheric noise is generally greater than internally generated noise even after attenuation ✓
即使在衰减之后，大气噪声通常也大于内部产生的噪声

E4C12. Which of the following has the largest effect on an SDR receiver's dynamic range?
以下哪项对SDR接收机的动态范围影响最大?

A. CPU register width in bits ✗
CPU寄存器宽度（以位为单位）
B. Anti-aliasing input filter bandwidth ✗
抗混叠输入滤波器带宽
C. RAM speed used for data storage ✗
用于数据存储的RAM速度
D. Analog-to-digital converter sample width in bits ✓
模数转换器采样宽度（以位为单位）

E4C13. How does a narrow-band roofing filter affect receiver performance?
窄带屋顶滤波器如何影响接收机性能?

A. It improves sensitivity by reducing front end noise ✗
它通过减少前端噪音来提高灵敏度
B. It improves intelligibility by using low Q circuitry to reduce ringing ✗
它通过使用低Q电路来减少振铃，从而提高清晰度
C. It improves dynamic range by attenuating strong signals near the receive frequency ✓
它通过衰减接收频率附近的强信号来提高动态范围
D. All these choices are correct ✗
所有这些选择都是正确的

E4C14. What transmit frequency might generate an image response signal in a receiver tuned to 14.300 MHz and that uses a 455 kHz IF frequency?
在调谐到14.300 MHz并且使用455 kHz IF频率的接收器中，什么发射频率可以产生图像响应信号?

A. 13.845 MHz ✗
13.845兆赫
B. 14.755 MHz ✗
14.755兆赫
C. 14.445 MHz ✗
14.445兆赫
D. 15.210 MHz ✓
15.210兆赫

E4C15. What is reciprocal mixing?
什么是相互混合?

A. Two out-of-band signals mixing to generate an in-band spurious signal ✗
两个带外信号混合生成带内杂散信号
B. In-phase signals cancelling in a mixer resulting in loss of receiver sensitivity ✗
混频器中的同相信号抵消导致接收器灵敏度的损失
C. Two digital signals combining from alternate time slots ✗
来自交替时隙的两个数字信号组合
D. Local oscillator phase noise mixing with adjacent strong signals to create interference to desired signals ✓
本地振荡器相位噪声与相邻强信号混合，对所需信号产生干扰

E4D Receiver performance characteristics: blocking dynamic range; intermodulation and cross-modulation interference; third-order intercept; desensitization; preselector
接收机性能特点：阻塞动态范围；互调和交叉调制干扰；三阶截距；脱敏；预选器

E4D01. What is meant by the blocking dynamic range of a receiver?
接收器的阻塞动态范围是什么意思?

A. The difference in dB between the noise floor and the level of an incoming signal that will cause 1 dB of gain compression ✓
本底噪声和将导致1 dB增益压缩的输入信号电平之间的差值（dB）
B. The minimum difference in dB between the levels of two FM signals that will cause one signal to block the other ✗
两个调频信号电平之间的最小差值（dB），会导致一个信号阻塞另一个信号
C. The difference in dB between the noise floor and the third-order intercept point ✗
本底噪声和三阶截距点之间的差值（dB）
D. The minimum difference in dB between two signals which produce third-order intermodulation products greater than the noise floor ✗
产生大于本底噪声的三阶互调产物的两个信号之间的最小差值（dB）

E4D02. Which of the following describes problems caused by poor dynamic range in a receiver?
以下哪一项描述了接收机动态范围差引起的问题?

A. Spurious signals caused by cross-modulation and desensitization from strong adjacent signals ✓
强相邻信号的交叉调制和脱敏引起的杂散信号
B. Oscillator instability requiring frequent retuning and loss of ability to recover the opposite sideband ✗
振荡器的不稳定性需要频繁的重新调谐，并失去恢复相对边带的能力
C. Cross-modulation of the desired signal and insufficient audio power to operate the speaker ✗
所需信号的交叉调制和操作扬声器的音频功率不足
D. Oscillator instability and severe audio distortion of all but the strongest received signals ✗
除最强接收信号外，所有接收信号的振荡器不稳定和严重音频失真

E4D03. How can intermodulation interference between two repeaters occur?
两个中继器之间的互调干扰是如何发生的?

A. When the repeaters are in close proximity and the signals cause feedback in the final amplifier of one or both transmitters ✗
当中继器非常接近并且信号在一个或两个发射机的最终放大器中引起反馈时
B. When the repeaters are in close proximity and the signals mix in the final amplifier of one or both transmitters ✓
当中继器非常接近并且信号在一个或两个发射机的最终放大器中混合时
C. When the signals from the transmitters are reflected out of phase from airplanes passing overhead ✗
当来自发射机的信号从头顶经过的飞机上异相反射时
D. When the signals from the transmitters are reflected in phase from airplanes passing overhead ✗
当来自发射机的信号在经过头顶的飞机上同相反射时

E4D04. Which of the following may reduce or eliminate intermodulation interference in a repeater caused by another transmitter operating in close proximity?
下列哪一项可以减少或消除中继器中由另一个发射机在附近运行引起的互调干扰?

A. A band-pass filter in the feed line between the transmitter and receiver ✗
发射机和接收机之间馈线中的带通滤波器
B. A properly terminated circulator at the output of the repeater's transmitter ✓
中继器发射机输出端适当端接的循环器
C. Utilizing a Class C final amplifier ✗
使用C类末级放大器
D. Utilizing a Class D final amplifier ✗
使用D类末级放大器

E4D05. What transmitter frequencies would cause an intermodulation-product signal in a receiver tuned to 146.70 MHz when a nearby station transmits on 146.52 MHz?
当附近的电台在146.52 MHz上发射时，哪些发射机频率会导致调谐到146.70 MHz的接收机中出现互调产物信号?

A. 146.34 MHz and 146.61 MHz ✓
146.34 MHz和146.61 MHz
B. 146.88 MHz and 146.34 MHz ✗
146.88 MHz和146.34 MHz
C. 146.10 MHz and 147.30 MHz ✗
146.10兆赫和147.30兆赫
D. 173.35 MHz and 139.40 MHz ✗
173.35 MHz和139.40 MHz

E4D06. What is the term for spurious signals generated by the combination of two or more signals in a non-linear device or circuit?
非线性设备或电路中两个或多个信号的组合产生的杂散信号的术语是什么?

A. Amplifier desensitization ✗
放大器脱敏
B. Neutralization ✗
中和
C. Adjacent channel interference ✗
相邻信道干扰
D. Intermodulation ✓
互调

E4D07. Which of the following reduces the likelihood of receiver desensitization?
以下哪项降低了受试者脱敏的可能性?

A. Decrease the RF bandwidth of the receiver ✓
降低接收器的射频带宽
B. Raise the receiver IF frequency ✗
提高接收机中频频率
C. Increase the receiver front end gain ✗
增加接收器前端增益
D. Switch from fast AGC to slow AGC ✗
从快速AGC切换到慢速AGC

E4D08. What causes intermodulation in an electronic circuit?
是什么导致了电子电路中的互调?

A. Too little gain ✗
收益太少
B. Lack of neutralization ✗
缺乏中和
C. Nonlinear circuits or devices ✓
非线性电路或设备
D. Positive feedback ✗
积极反馈

E4D09. What is the purpose of the preselector in a communications receiver?
通信接收机中预选器的用途是什么?

A. To store often-used frequencies ✗
存储常用频率
B. To provide a range of AGC time constants ✗
提供一系列AGC时间常数
C. To increase rejection of signals outside the desired band ✓
增加对所需频带外信号的抑制
D. To allow selection of the optimum RF amplifier device ✗
选择最佳射频放大器设备

E4D10. What does a third-order intercept level of 40 dBm mean with respect to receiver performance?
40 dBm的三阶截获电平对接收机性能意味着什么?

A. Signals less than 40 dBm will not generate audible third-order intermodulation products ✗
小于40 dBm的信号不会产生可听见的三阶互调产物
B. The receiver can tolerate signals up to 40 dB above the noise floor without producing third-order intermodulation products ✗
接收器可以容忍噪声基底以上高达40dB的信号，而不会产生三阶互调产物
C. A pair of 40 dBm input signals will theoretically generate a third-order intermodulation product that has the same output amplitude as either of the input signals ✓
理论上，一对40dBm的输入信号将产生三阶互调产物，该互调产物具有与任一输入信号相同的输出幅度
D. A pair of 1 mW input signals will produce a third-order intermodulation product that is 40 dB stronger than the input signal ✗
一对1mW的输入信号将产生比输入信号强40dB的三阶互调产物

E4D11. Why are odd-order intermodulation products, created within a receiver, of particular interest compared to other products?
为什么在接收器内创建的奇数阶互调产品与其他产品相比特别令人感兴趣?

A. Odd-order products of two signals in the band of interest are also likely to be within the band ✓
感兴趣频带中两个信号的奇数阶乘积也可能在频带内
B. Odd-order products overload the IF filters ✗
奇数阶产品使IF滤波器过载
C. Odd-order products are an indication of poor image rejection ✗
奇数订单产品表明图像拒绝率低
D. Odd-order intermodulation produces three products for every input signal within the band of interest ✗
奇数阶互调为感兴趣频带内的每个输入信号产生三个乘积

E4D12. What is the term for the reduction in receiver sensitivity caused by a strong signal near the received frequency?
接收频率附近的强信号导致接收器灵敏度降低的术语是什么?

A. Desensitization ✓
脱敏作用
B. Quieting ✗
安静
C. Cross-modulation interference ✗
交叉调制干扰
D. Squelch gain rollback ✗
静噪增益回滚

E4E Noise suppression and interference: system noise; electrical appliance noise; line noise; locating noise sources; DSP noise reduction; noise blankers; grounding for signals; common mode currents
噪声抑制和干扰：系统噪声；电器噪声；线路噪声；定位噪声源；DSP降噪；噪声抑制器；信号接地；共模电流

E4E01. What problem can occur when using an automatic notch filter (ANF) to remove interfering carriers while receiving CW signals?
当在接收CW信号时使用自动陷波滤波器（ANF）来去除干扰载波时，会出现什么问题?

A. Removal of the CW signal as well as the interfering carrier ✓
去除CW信号和干扰载波
B. Any nearby signal passing through the DSP system will overwhelm the desired signal ✗
任何通过DSP系统的附近信号都会淹没所需信号
C. Received CW signals will appear to be modulated at the DSP clock frequency ✗
接收到的CW信号将以DSP时钟频率进行调制
D. Ringing in the DSP filter will completely remove the spaces between the CW characters ✗
DSP滤波器中的振铃将完全消除CW字符之间的空格

E4E02. Which of the following types of noise can often be reduced with a digital signal processing noise filter?
以下哪种类型的噪声通常可以通过数字信号处理噪声滤波器来降低?

A. Broadband white noise ✗
宽带白噪声
B. Ignition noise ✗
点火噪音
C. Power line noise ✗
电源线噪声
D. All these choices are correct ✓
所有这些选择都是正确的

E4E03. Which of the following signals might a receiver noise blanker be able to remove from desired signals?
接收机噪声消除器能够从期望的信号中去除以下哪种信号?

A. Signals that are constant at all IF levels ✗
在所有IF电平下都是恒定的信号
B. Signals that appear across a wide bandwidth ✓
出现在宽带宽上的信号
C. Signals that appear at one IF but not another ✗
出现在一个中频而不出现在另一个中频的信号
D. Signals that have a sharply peaked frequency distribution ✗
具有急剧峰值频率分布的信号

E4E04. How can conducted and radiated noise caused by an automobile alternator be suppressed?
如何抑制汽车交流发电机产生的传导和辐射噪声?

A. By installing filter capacitors in series with the DC power lead and a blocking capacitor in the field lead ✗
通过在直流电源引线上串联安装滤波电容器，并在现场引线上安装阻塞电容器
B. By installing a noise suppression resistor and a blocking capacitor in both leads ✗
通过在两条导线中安装一个噪声抑制电阻器和一个阻塞电容器
C. By installing a high-pass filter in series with the radio's power lead and a low-pass filter in parallel with the field lead ✗
通过安装一个与收音机电源线串联的高通滤波器和一个与场导线并联的低通滤波器
D. By connecting the radio's power leads directly to the battery and by installing coaxial capacitors in line with the alternator leads ✓
通过将收音机的电源引线直接连接到蓄电池，并将同轴电容器安装在交流发电机引线上

E4E05. How can radio frequency interference from an AC motor be suppressed?
如何抑制来自交流电机的射频干扰?

A. By installing a high-pass filter in series with the motor's power leads ✗
通过将高通滤波器与电机的电源线串联安装
B. By installing a brute-force AC-line filter in series with the motor leads ✓
通过安装与电机引线串联的强力交流线路滤波器
C. By installing a bypass capacitor in series with the motor leads ✗
通过安装与电机引线串联的旁路电容器
D. By using a ground-fault current interrupter in the circuit used to power the motor ✗
通过在为电机供电的电路中使用接地故障电流断路器

E4E06. What is one type of electrical interference that might be caused by a nearby personal computer?
附近的个人电脑可能造成的一种电气干扰是什么?

A. A loud AC hum in the audio output of your station receiver ✗
电台接收器的音频输出中有巨大的交流嗡嗡声
B. A clicking noise at intervals of a few seconds ✗
每隔几秒钟就会发出咔嗒声
C. The appearance of unstable modulated or unmodulated signals at specific frequencies ✓
在特定频率下出现不稳定的调制或未调制信号
D. A whining type noise that continually pulses off and on ✗
一种不断时断时续的呜呜声

E4E07. Which of the following can cause shielded cables to radiate or receive interference?
以下哪项会导致屏蔽电缆辐射或接收干扰?

A. Low inductance ground connections at both ends of the shield ✗
屏蔽两端的低电感接地连接
B. Common-mode currents on the shield and conductors ✓
屏蔽和导体上的共模电流
C. Use of braided shielding material ✗
编织屏蔽材料的使用
D. Tying all ground connections to a common point resulting in differential-mode currents in the shield ✗
将所有接地连接连接到一个公共点，从而在屏蔽中产生差模电流

E4E08. What current flows equally on all conductors of an unshielded multi-conductor cable?
非屏蔽多导体电缆的所有导体上的电流相等?

A. Differential-mode current ✗
差模电流
B. Common-mode current ✓
共模电流
C. Reactive current only ✗
仅限无功电流
D. Return current ✗
回流电流

E4E09. What undesirable effect can occur when using an IF noise blanker?
当使用中频噪声抑制器时，会出现什么不希望的效果?

A. Received audio in the speech range might have an echo effect ✗
接收到的语音范围内的音频可能具有回声效果
B. The audio frequency bandwidth of the received signal might be compressed ✗
接收信号的音频带宽可能被压缩
C. Nearby signals may appear to be excessively wide even if they meet emission standards ✓
即使附近的信号符合排放标准，它们也可能显得过于宽
D. FM signals can no longer be demodulated ✗
调频信号无法再解调

E4E10. What might be the cause of a loud roaring or buzzing AC line interference that comes and goes at intervals?
可能是什么原因导致交流线路干扰时而来时而去?

A. Arcing contacts in a thermostatically controlled device ✗
恒温控制设备中的电弧触点
B. A defective doorbell or doorbell transformer inside a nearby residence ✗
附近住宅内有缺陷的门铃或门铃变压器
C. A malfunctioning illuminated advertising display ✗
照明广告显示屏出现故障
D. All these choices are correct ✓
所有这些选择都是正确的

E4E11. What could cause local AM broadcast band signals to combine to generate spurious signals in the MF or HF bands?
是什么原因导致本地AM广播频带信号组合在MF或HF频带中产生杂散信号?

A. One or more of the broadcast stations is transmitting an over-modulated signal ✗
一个或多个广播站正在发送过调制信号
B. Nearby corroded metal joints are mixing and re-radiating the broadcast signals ✓
附近被腐蚀的金属接头正在混合并重新辐射广播信号
C. You are receiving skywave signals from a distant station ✗
你正在接收来自远处电台的天波信号
D. Your station receiver IF amplifier stage is defective ✗
您的电台接收机中频放大器级有缺陷

E5A Resonance and Q: characteristics of resonant circuits: series and parallel resonance; definitions and effects of Q; half-power bandwidth; phase relationships in reactive circuits
谐振和Q：谐振电路的特性：串联谐振和并联谐振；Q的定义和影响；半功率带宽；无功电路中的相位关系

E5A01. What can cause the voltage across reactances in a series RLC circuit to be higher than the voltage applied to the entire circuit?
是什么原因导致串联RLC电路中电抗两端的电压高于施加到整个电路的电压?

A. Resonance ✓
洪亮
B. Capacitance ✗
电容
C. Conductance ✗
传导性
D. Resistance ✗
反对

E5A02. What is resonance in an LC or RLC circuit?
LC或RLC电路中的谐振是什么?

A. The highest frequency that will pass current ✗
通过电流的最高频率
B. The lowest frequency that will pass current ✗
通过电流的最低频率
C. The frequency at which the capacitive reactance equals the inductive reactance ✓
容抗等于感抗的频率
D. The frequency at which the reactive impedance equals the resistive impedance ✗
无功阻抗等于电阻阻抗的频率

E5A03. What is the magnitude of the impedance of a series RLC circuit at resonance?
谐振时串联RLC电路的阻抗大小是多少?

A. High, as compared to the circuit resistance ✗
与电路电阻相比高
B. Approximately equal to capacitive reactance ✗
大约等于容抗
C. Approximately equal to inductive reactance ✗
大约等于电感电抗
D. Approximately equal to circuit resistance ✓
大约等于电路电阻

E5A04. What is the magnitude of the impedance of a parallel RLC circuit at resonance?
谐振时并联RLC电路的阻抗大小是多少?

A. Approximately equal to circuit resistance ✓
大约等于电路电阻
B. Approximately equal to inductive reactance ✗
大约等于电感电抗
C. Low compared to the circuit resistance ✗
与电路电阻相比低
D. High compared to the circuit resistance ✗
与电路电阻相比偏高

E5A05. What is the result of increasing the Q of an impedance-matching circuit?
增加阻抗匹配电路的Q值的结果是什么?

A. Matching bandwidth is decreased ✓
匹配带宽减少
B. Matching bandwidth is increased ✗
匹配带宽增加
C. Matching range is increased ✗
匹配范围增加
D. It has no effect on impedance matching ✗
它对阻抗匹配没有影响

E5A06. What is the magnitude of the circulating current within the components of a parallel LC circuit at resonance?
谐振时并联LC电路组件内的循环电流大小是多少?

A. It is at a minimum ✗
这是最低限度的
B. It is at a maximum ✓
它处于最大值
C. It equals 1 divided by the quantity 2 times pi, multiplied by the square root of inductance L multiplied by capacitance C ✗
它等于1除以2乘以π，再乘以电感L乘以电容C的平方根
D. It equals 2 multiplied by pi, multiplied by frequency, multiplied by inductance ✗
它等于2乘以π，乘以频率，乘以电感

E5A07. What is the magnitude of the current at the input of a parallel RLC circuit at resonance?
谐振时并联RLC电路输入端的电流大小是多少?

A. Minimum ✓
最低限度
B. Maximum ✗
最大限度
C. R/L ✗
D. L/R ✗

E5A08. What is the phase relationship between the current through and the voltage across a series resonant circuit at resonance?
在谐振时，通过串联谐振电路的电流和电压之间的相位关系是什么?

A. The voltage leads the current by 90 degrees ✗
电压使电流超前90度
B. The current leads the voltage by 90 degrees ✗
电流使电压超前90度
C. The voltage and current are in phase ✓
电压和电流同相
D. The voltage and current are 180 degrees out of phase ✗
电压和电流相差180度

E5A09. How is the Q of an RLC parallel resonant circuit calculated?
RLC并联谐振电路的Q是如何计算的?

A. Reactance of either the inductance or capacitance divided by the resistance ✗
电感或电容除以电阻的电抗
B. Reactance of either the inductance or capacitance multiplied by the resistance ✗
电感或电容乘以电阻的电抗
C. Resistance divided by the reactance of either the inductance or capacitance ✓
电阻除以电感或电容的电抗
D. Reactance of the inductance multiplied by the reactance of the capacitance ✗
电感电抗乘以电容电抗

E5A10. How is the Q of an RLC series resonant circuit calculated?
RLC串联谐振电路的Q是如何计算的?

A. Reactance of either the inductance or capacitance divided by the resistance ✓
电感或电容除以电阻的电抗
B. Reactance of either the inductance or capacitance multiplied by the resistance ✗
电感或电容乘以电阻的电抗
C. Resistance divided by the reactance of either the inductance or capacitance ✗
电阻除以电感或电容的电抗
D. Reactance of the inductance multiplied by the reactance of the capacitance ✗
电感电抗乘以电容电抗

E5A11. What is the half-power bandwidth of a resonant circuit that has a resonant frequency of 7.1 MHz and a Q of 150?
谐振频率为7.1MHz、Q为150的谐振电路的半功率带宽是多少?

A. 157.8 Hz ✗
157.8赫兹
B. 315.6 Hz ✗
315.6赫兹
C. 47.3 kHz ✓
47.3千赫
D. 23.67 kHz ✗
23.67千赫

E5A12. What is the half-power bandwidth of a resonant circuit that has a resonant frequency of 3.7 MHz and a Q of 118?
谐振频率为3.7MHz、Q为118的谐振电路的半功率带宽是多少?

A. 436.6 kHz ✗
436.6千赫
B. 218.3 kHz ✗
218.3千赫
C. 31.4 kHz ✓
31.4千赫
D. 15.7 kHz ✗
15.7千赫

E5A13. What is an effect of increasing Q in a series resonant circuit?
在串联谐振电路中增加Q的影响是什么?

A. Fewer components are needed for the same performance ✗
相同性能所需的组件更少
B. Parasitic effects are minimized ✗
寄生效应最小化
C. Internal voltages increase ✓
内部电压增加
D. Phase shift can become uncontrolled ✗
相移可能变得不受控制

E5A14. What is the resonant frequency of an RLC circuit if R is 22 ohms, L is 50 microhenries and C is 40 picofarads?
如果R是22欧姆，L是50微亨，C是40皮法拉，RLC电路的谐振频率是多少?

A. 44.72 MHz ✗
44.72兆赫
B. 22.36 MHz ✗
22.36兆赫
C. 3.56 MHz ✓
3.56兆赫
D. 1.78 MHz ✗
1.78兆赫

E5A15. Which of the following increases Q for inductors and capacitors?
以下哪项会增加电感器和电容器的Q值?

A. Lower losses ✓
降低损失
B. Lower reactance ✗
较低电抗
C. Lower self-resonant frequency ✗
较低的自谐振频率
D. Higher self-resonant frequency ✗
更高的自谐振频率

E5A16. What is the resonant frequency of an RLC circuit if R is 33 ohms, L is 50 microhenries and C is 10 picofarads?
如果R是33欧姆，L是50微亨，C是10皮法拉，RLC电路的谐振频率是多少?

A. 23.5 MHz ✗
23.5兆赫
B. 23.5 kHz ✗
23.5千赫
C. 7.12 kHz ✗
7.12千赫
D. 7.12 MHz ✓
7.12兆赫

E5B Time constants and phase relationships: RL and RC time constants; phase angle in reactive circuits and components; admittance and susceptance
时间常数和相位关系：RL和RC时间常数；无功电路和部件的相位角；导纳和电纳

E5B01. What is the term for the time required for the capacitor in an RC circuit to be charged to 63.2% of the applied voltage or to discharge to 36.8% of its initial voltage?
RC电路中的电容器充电至施加电压的63.2%或放电至初始电压的36.8%所需的时间是什么?

A. An exponential rate of one ✗
一的指数速率
B. One time constant ✓
一个时间常数
C. One exponential period ✗
一个指数周期
D. A time factor of one ✗
一的时间因子

E5B02. What letter is commonly used to represent susceptance?
什么字母通常用来表示电纳?

A. G ✗
B. X ✗
十、
C. Y ✗
D. B ✓

E5B03. How is impedance in polar form converted to an equivalent admittance?
极性形式的阻抗如何转换为等效导纳?

A. Take the reciprocal of the angle and change the sign of the magnitude ✗
取角度的倒数，改变幅度的符号
B. Take the reciprocal of the magnitude and change the sign of the angle ✓
取大小的倒数，改变角度的符号
C. Take the square root of the magnitude and add 180 degrees to the angle ✗
取幅值的平方根，将角度加180度
D. Square the magnitude and subtract 90 degrees from the angle ✗
将幅度平方并从角度中减去90度

E5B04. What is the time constant of a circuit having two 220 microfarad capacitors and two 1 megohm resistors, all in parallel?
两个220微法拉电容器和两个1兆欧电阻器并联的电路的时间常数是多少?

A. 55 seconds ✗
55秒
B. 110 seconds ✗
110秒
C. 440 seconds ✗
440秒
D. 220 seconds ✓
220秒

E5B05. What happens to the magnitude of a pure reactance when it is converted to a susceptance?
当纯电抗转换为电纳时，其大小会发生什么变化?

A. It is unchanged ✗
它没有变化
B. The sign is reversed ✗
标志颠倒了
C. It is shifted by 90 degrees ✗
它移动了90度
D. It becomes the reciprocal ✓
它变成了倒数

E5B06. What is susceptance?
什么是电纳?

A. The magnetic impedance of a circuit ✗
电路的磁阻抗
B. The ratio of magnetic field to electric field ✗
磁场与电场之比
C. The imaginary part of admittance ✓
导纳的虚部
D. A measure of the efficiency of a transformer ✗
衡量变压器效率的指标

E5B07. What is the phase angle between the voltage across and the current through a series RLC circuit if XC is 500 ohms, R is 1 kilohm, and XL is 250 ohms?
如果XC是500欧姆，R是1千欧姆，XL是250欧姆，那么RLC串联电路两端的电压和电流之间的相位角是多少?

A. 68.2 degrees with the voltage leading the current ✗
68.2度，电压领先电流
B. 14.0 degrees with the voltage leading the current ✗
14.0度，电压领先电流
C. 14.0 degrees with the voltage lagging the current ✓
14.0度，电压滞后于电流
D. 68.2 degrees with the voltage lagging the current ✗
68.2度，电压滞后于电流

E5B08. What is the phase angle between the voltage across and the current through a series RLC circuit if XC is 100 ohms, R is 100 ohms, and XL is 75 ohms?
如果XC是100欧姆，R是100欧姆并且XL是75欧姆，那么RLC串联电路两端的电压和电流之间的相位角是多少?

A. 14 degrees with the voltage lagging the current ✓
14度，电压滞后于电流
B. 14 degrees with the voltage leading the current ✗
14度，电压领先电流
C. 76 degrees with the voltage leading the current ✗
76度，电压领先电流
D. 76 degrees with the voltage lagging the current ✗
76度，电压滞后于电流

E5B09. What is the relationship between the AC current through a capacitor and the voltage across a capacitor?
通过电容器的交流电流和电容器两端的电压之间的关系是什么?

A. Voltage and current are in phase ✗
电压和电流同相
B. Voltage and current are 180 degrees out of phase ✗
电压和电流相差180度
C. Voltage leads current by 90 degrees ✗
电压超前电流90度
D. Current leads voltage by 90 degrees ✓
电流领先电压90度

E5B10. What is the relationship between the AC current through an inductor and the voltage across an inductor?
通过电感器的交流电流和电感器两端的电压之间的关系是什么?

A. Voltage leads current by 90 degrees ✓
电压超前电流90度
B. Current leads voltage by 90 degrees ✗
电流领先电压90度
C. Voltage and current are 180 degrees out of phase ✗
电压和电流相差180度
D. Voltage and current are in phase ✗
电压和电流同相

E5B11. What is the phase angle between the voltage across and the current through a series RLC circuit if XC is 25 ohms, R is 100 ohms, and XL is 50 ohms?
如果XC为25欧姆，R为100欧姆，XL为50欧姆，则RLC串联电路两端的电压和电流之间的相位角是多少?

A. 14 degrees with the voltage lagging the current ✗
14度，电压滞后于电流
B. 14 degrees with the voltage leading the current ✓
14度，电压领先电流
C. 76 degrees with the voltage lagging the current ✗
76度，电压滞后于电流
D. 76 degrees with the voltage leading the current ✗
76度，电压领先电流

E5B12. What is admittance?
什么是准入?

A. The inverse of impedance ✓
阻抗的倒数
B. The term for the gain of a field effect transistor ✗
场效应晶体管增益的术语
C. The turns ratio of a transformer ✗
变压器的匝数比
D. The inverse of Q factor ✗
Q因子的倒数

E5C Coordinate systems and phasors in electronics: Rectangular Coordinates; Polar Coordinates; Phasors
电子技术中的坐标系和相量：直角坐标；极坐标；相量

E5C01. Which of the following represents capacitive reactance in rectangular notation?
以下哪一项表示矩形符号中的容抗?

A. -jX ✓
B. +jX ✗
C. Delta ✗
希腊字母表的第4个字母
D. Omega ✗
欧米茄

E5C02. How are impedances described in polar coordinates?
如何在极坐标中描述阻抗?

A. By X and R values ✗
按X和R值
B. By real and imaginary parts ✗
通过实部和虚部
C. By phase angle and magnitude ✓
按相位角和幅度
D. By Y and G values ✗
按Y和G值

E5C03. Which of the following represents an inductive reactance in polar coordinates?
下列哪一项表示极坐标中的电感电抗?

A. A positive magnitude ✗
正震级
B. A negative magnitude ✗
负震级
C. A positive phase angle ✓
正相位角
D. A negative phase angle ✗
负相位角

E5C04. What coordinate system is often used to display the resistive, inductive, and/or capacitive reactance components of impedance?
通常使用什么坐标系来显示阻抗的电阻、电感和/或容抗分量?

A. Maidenhead grid ✗
梅登黑德电网
B. Faraday grid ✗
法拉第栅格
C. Elliptical coordinates ✗
椭圆坐标
D. Rectangular coordinates ✓
矩形坐标

E5C05. What is the name of the diagram used to show the phase relationship between impedances at a given frequency?
用于显示给定频率下阻抗之间的相位关系的图的名称是什么?

A. Venn diagram ✗
维恩图
B. Near field diagram ✗
近场图
C. Phasor diagram ✓
相量图
D. Far field diagram ✗
远场图

E5C06. What does the impedance 50-j25 represent?
阻抗50-j25代表什么?

A. 50 ohms resistance in series with 25 ohms inductive reactance ✗
50欧姆电阻与25欧姆电感电抗串联
B. 50 ohms resistance in series with 25 ohms capacitive reactance ✓
50欧姆电阻与25欧姆容抗串联
C. 25 ohms resistance in series with 50 ohms inductive reactance ✗
25欧姆电阻与50欧姆电感电抗串联
D. 25 ohms resistance in series with 50 ohms capacitive reactance ✗
25欧姆电阻与50欧姆容抗串联

E5C07. Where is the impedance of a pure resistance plotted on rectangular coordinates?
在直角坐标上绘制的纯电阻的阻抗在哪里?

A. On the vertical axis ✗
在垂直轴上
B. On a line through the origin, slanted at 45 degrees ✗
在穿过原点的直线上，倾斜45度
C. On a horizontal line, offset vertically above the horizontal axis ✗
在水平线上，在水平轴上方垂直偏移
D. On the horizontal axis ✓
在水平轴上

E5C08. What coordinate system is often used to display the phase angle of a circuit containing resistance, inductive and/or capacitive reactance?
通常使用哪个坐标系来显示包含电阻、电感和/或容抗的电路的相位角?

A. Maidenhead grid ✗
梅登黑德电网
B. Faraday grid ✗
法拉第栅格
C. Elliptical coordinates ✗
椭圆坐标
D. Polar coordinates ✓
极坐标

E5C09. When using rectangular coordinates to graph the impedance of a circuit, what do the axes represent?
当使用直角坐标绘制电路阻抗图时，轴代表什么?

A. The X axis represents the resistive component and the Y axis represents the reactive component ✓
X轴表示电阻分量，Y轴表示电抗分量
B. The X axis represents the reactive component and the Y axis represents the resistive component ✗
X轴表示电抗分量，Y轴表示电阻分量
C. The X axis represents the phase angle and the Y axis represents the magnitude ✗
X轴表示相位角，Y轴表示幅度
D. The X axis represents the magnitude and the Y axis represents the phase angle ✗
X轴表示幅度，Y轴表示相位角

E5C10. Which point on Figure E5-1 best represents the impedance of a series circuit consisting of a 400-ohm resistor and a 38-picofarad capacitor at 14 MHz?
图E5-1中的哪一点最能代表由400欧姆电阻器和38皮法拉电容器组成的串联电路在14MHz下的阻抗?

A. Point 2 ✗
第2点
B. Point 4 ✓
第4点
C. Point 5 ✗
第5点
D. Point 6 ✗
第6点

E5C11. Which point in Figure E5-1 best represents the impedance of a series circuit consisting of a 300-ohm resistor and an 18-microhenry inductor at 3.505 MHz?
图E5-1中的哪一点最能代表由300欧姆电阻器和18微亨电感器组成的串联电路在3.505 MHz下的阻抗?

A. Point 1 ✗
第1点
B. Point 3 ✓
第3点
C. Point 7 ✗
第7点
D. Point 8 ✗
第8点

E5C12. Which point on Figure E5-1 best represents the impedance of a series circuit consisting of a 300-ohm resistor and a 19-picofarad capacitor at 21.200 MHz?
图E5-1中的哪一点最能代表由300欧姆电阻器和19皮法拉电容器组成的串联电路在21.200 MHz下的阻抗?

A. Point 1 ✓
第1点
B. Point 3 ✗
第3点
C. Point 7 ✗
第7点
D. Point 8 ✗
第8点

E5D AC and RF energy in real circuits: skin effect; electromagnetic fields; reactive power; power factor; electrical length of conductors at UHF and microwave frequencies; microstrip
实际电路中的交流和射频能量：趋肤效应；电磁场；无功功率；功率因数；UHF和微波频率下导体的电气长度；微带

E5D01. What is the result of skin effect?
皮肤效应的结果是什么?

A. As frequency increases, RF current flows in a thinner layer of the conductor, closer to the surface ✓
随着频率的增加，射频电流在更薄的导体层中流动，更靠近表面
B. As frequency decreases, RF current flows in a thinner layer of the conductor, closer to the surface ✗
随着频率的降低，射频电流在更薄的导体层中流动，更靠近表面
C. Thermal effects on the surface of the conductor increase the impedance ✗
导体表面的热效应会增加阻抗
D. Thermal effects on the surface of the conductor decrease the impedance ✗
导体表面的热效应会降低阻抗

E5D02. Why is it important to keep lead lengths short for components used in circuits for VHF and above?
为什么保持VHF及以上电路中使用的元件的引线长度较短很重要?

A. To increase the thermal time constant ✗
增加热时间常数
B. To avoid unwanted inductive reactance ✓
为了避免不需要的电感电抗
C. To maintain component lifetime ✗
保持组件寿命
D. All these choices are correct ✗
所有这些选择都是正确的

E5D03. What is microstrip?
什么是微带?

A. Lightweight transmission line made of common zip cord ✗
由普通拉链制成的轻型传输线
B. Miniature coax used for low power applications ✗
用于低功率应用的微型同轴电缆
C. Short lengths of coax mounted on printed circuit boards to minimize time delay between microwave circuits ✗
安装在印刷电路板上的短同轴电缆，以最大限度地减少微波电路之间的时间延迟
D. Precision printed circuit conductors above a ground plane that provide constant impedance interconnects at microwave frequencies ✓
接地平面上的精密印刷电路导体，在微波频率下提供恒定阻抗互连

E5D04. Why are short connections used at microwave frequencies?
为什么在微波频率下使用短连接?

A. To increase neutralizing resistance ✗
增加中和阻力
B. To reduce phase shift along the connection ✓
减少沿连接的相移
C. To increase compensating capacitance ✗
增加补偿电容
D. To reduce noise figure ✗
降低噪声系数

E5D05. What is the power factor of an RL circuit having a 30-degree phase angle between the voltage and the current?
电压和电流之间具有30度相位角的RL电路的功率因数是多少?

A. 1.73 ✗
1.73
B. 0.5 ✗
0.5
C. 0.866 ✓
0.866
D. 0.577 ✗
0.577

E5D06. In what direction is the magnetic field oriented about a conductor in relation to the direction of electron flow?
相对于电子流的方向，导体周围的磁场定向在哪个方向?

A. In the same direction as the current ✗
与电流方向相同
B. In a direction opposite to the current ✗
在与电流相反的方向
C. In all directions; omni-directional ✗
在各个方向；全向
D. In a circle around the conductor ✓
绕导体一圈

E5D07. How many watts are consumed in a circuit having a power factor of 0.71 if the apparent power is 500VA?
如果表观功率为500VA，那么在功率因数为0.71的电路中消耗多少瓦?

A. 704 W ✗
B. 355 W ✓
355瓦
C. 252 W ✗
252瓦
D. 1.42 mW ✗

E5D08. How many watts are consumed in a circuit having a power factor of 0.6 if the input is 200VAC at 5 amperes?
如果输入是5安培的200VAC，那么在功率因数为0.6的电路中消耗多少瓦?

A. 200 watts ✗
200瓦
B. 1000 watts ✗
1000瓦
C. 1600 watts ✗
1600瓦
D. 600 watts ✓
600瓦

E5D09. What happens to reactive power in an AC circuit that has both ideal inductors and ideal capacitors?
在既有理想电感器又有理想电容器的交流电路中，无功功率会发生什么?

A. It is dissipated as heat in the circuit ✗
它在电路中作为热量耗散
B. It is repeatedly exchanged between the associated magnetic and electric fields, but is not dissipated ✓
它在相关的磁场和电场之间反复交换，但不会消散
C. It is dissipated as kinetic energy in the circuit ✗
它在电路中作为动能耗散
D. It is dissipated in the formation of inductive and capacitive fields ✗
它在感应场和电容场的形成中耗散

E5D10. How can the true power be determined in an AC circuit where the voltage and current are out of phase?
在电压和电流异相的交流电路中，如何确定真实功率?

A. By multiplying the apparent power by the power factor ✓
通过将视在功率乘以功率因数
B. By dividing the reactive power by the power factor ✗
通过将无功功率除以功率因数
C. By dividing the apparent power by the power factor ✗
通过将视在功率除以功率因数
D. By multiplying the reactive power by the power factor ✗
通过将无功功率乘以功率因数

E5D11. What is the power factor of an RL circuit having a 60-degree phase angle between the voltage and the current?
电压和电流之间具有60度相位角的RL电路的功率因数是多少?

A. 1.414 ✗
1.414
B. 0.866 ✗
0.866
C. 0.5 ✓
0.5
D. 1.73 ✗
1.73

E5D12. How many watts are consumed in a circuit having a power factor of 0.2 if the input is 100 VAC at 4 amperes?
如果输入是4安培的100VAC，那么在功率因数为0.2的电路中消耗多少瓦?

A. 400 watts ✗
400瓦
B. 80 watts ✓
80瓦
C. 2000 watts ✗
2000瓦
D. 50 watts ✗
50瓦

E5D13. How many watts are consumed in a circuit consisting of a 100-ohm resistor in series with a 100-ohm inductive reactance drawing 1 ampere?
一个由100欧姆电阻器与100欧姆电感电抗串联组成的电路消耗了多少瓦?

A. 70.7 watts ✗
70.7瓦
B. 100 watts ✓
100瓦
C. 141.4 watts ✗
141.4瓦
D. 200 watts ✗
200瓦

E5D14. What is reactive power?
什么是无功功率?

A. Wattless, nonproductive power ✓
无瓦、无生产力
B. Power consumed in wire resistance in an inductor ✗
电感器中导线电阻消耗的功率
C. Power lost because of capacitor leakage ✗
电容器泄漏造成的电力损失
D. Power consumed in circuit Q ✗
电路Q中消耗的功率

E5D15. What is the power factor of an RL circuit having a 45-degree phase angle between the voltage and the current?
电压和电流之间具有45度相位角的RL电路的功率因数是多少?

A. 0.866 ✗
0.866
B. 1 ✗
1
C. 0.5 ✗
0.5
D. 0.707 ✓
0.707

E6 CIRCUIT COMPONENTS
电路元件

E6A Semiconductor materials and devices: semiconductor materials; germanium, silicon, P-type, N-type; transistor types: NPN, PNP, junction, field-effect transistors: enhancement mode; depletion mode; MOS; CMOS; N-channel; P-channel
半导体材料和器件：半导体材料；锗、硅、P型、N型；晶体管类型：NPN，PNP，结，场效应晶体管：增强模式；损耗模式；MOS；CMOS；N通道；P-通道

E6A01. In what application is gallium arsenide used as a semiconductor material?
砷化镓在什么应用中被用作半导体材料?

A. In high-current rectifier circuits ✗
在大电流整流器电路中
B. In high-power audio circuits ✗
在高功率音频电路中
C. In microwave circuits ✓
在微波电路中
D. In very low-frequency RF circuits ✗
在非常低频的RF电路中

E6A02. Which of the following semiconductor materials contains excess free electrons?
以下哪种半导体材料含有过量的自由电子?

A. N-type ✓
N型
B. P-type ✗
P型
C. Bipolar ✗
双极性
D. Insulated gate ✗
绝缘门

E6A03. Why does a PN-junction diode not conduct current when reverse biased?
为什么PN结二极管在反向偏置时不导通电流?

A. Only P-type semiconductor material can conduct current ✗
只有P型半导体材料才能传导电流
B. Only N-type semiconductor material can conduct current ✗
只有N型半导体材料才能传导电流
C. Holes in P-type material and electrons in the N-type material are separated by the applied voltage, widening the depletion region ✓
P型材料中的空穴和N型材料中电子被施加的电压分离，从而加宽耗尽区
D. Excess holes in P-type material combine with the electrons in N-type material, converting the entire diode into an insulator ✗
P型材料中多余的空穴与N型材料中的电子结合，将整个二极管转化为绝缘体

E6A04. What is the name given to an impurity atom that adds holes to a semiconductor crystal structure?
在半导体晶体结构中添加空穴的杂质原子的名字是什么?

A. Insulator impurity ✗
绝缘子杂质
B. N-type impurity ✗
N型杂质
C. Acceptor impurity ✓
受体杂质
D. Donor impurity ✗
施主杂质

E6A05. How does DC input impedance at the gate of a field-effect transistor compare with the DC input impedance of a bipolar transistor?
场效应晶体管栅极的直流输入阻抗与双极晶体管的直流输入电阻相比如何?

A. They are both low impedance ✗
它们都是低阻抗
B. An FET has lower input impedance ✗
FET的输入阻抗较低
C. An FET has higher input impedance ✓
FET具有更高的输入阻抗
D. They are both high impedance ✗
它们都是高阻抗

E6A06. What is the beta of a bipolar junction transistor?
双极结晶体管的β是多少?

A. The frequency at which the current gain is reduced to 0.707 ✗
电流增益降低到0.707的频率
B. The change in collector current with respect to base current ✓
集电极电流相对于基极电流的变化
C. The breakdown voltage of the base to collector junction ✗
基极-集电极结的击穿电压
D. The switching speed ✗
切换速度

E6A07. Which of the following indicates that a silicon NPN junction transistor is biased on?
以下哪一项表明硅NPN结晶体管被偏置导通?

A. Base-to-emitter resistance of approximately 6 to 7 ohms ✗
基极到发射极的电阻约为6到7欧姆
B. Base-to-emitter resistance of approximately 0.6 to 0.7 ohms ✗
基极至发射极电阻约为0.6至0.7欧姆
C. Base-to-emitter voltage of approximately 6 to 7 volts ✗
基极至发射极电压约为6至7伏
D. Base-to-emitter voltage of approximately 0.6 to 0.7 volts ✓
基极至发射极电压约为0.6至0.7伏

E6A08. What term indicates the frequency at which the grounded-base current gain of a transistor has decreased to 0.7 of the gain obtainable at 1 kHz?
哪个项表示晶体管的接地基极电流增益已降至1kHz下可获得增益的0.7的频率?

A. Corner frequency ✗
拐角频率
B. Alpha rejection frequency ✗
阿尔法抑制频率
C. Beta cutoff frequency ✗
贝塔截止频率
D. Alpha cutoff frequency ✓
Alpha截止频率

E6A09. What is a depletion-mode FET?
什么是耗尽型FET?

A. An FET that exhibits a current flow between source and drain when no gate voltage is applied ✓
当没有施加栅极电压时，在源极和漏极之间显示电流的FET
B. An FET that has no current flow between source and drain when no gate voltage is applied ✗
当没有施加栅极电压时，源极和漏极之间没有电流流动的FET
C. Any FET without a channel ✗
任何没有通道的FET
D. Any FET for which holes are the majority carriers ✗
空穴占多数载流子的任何FET

E6A10. In Figure E6-1, what is the schematic symbol for an N-channel dual-gate MOSFET?
在图E6-1中，N沟道双栅极MOSFET的示意符号是什么?

A. 2 ✗
2
B. 4 ✓
4
C. 5 ✗
5
D. 6 ✗
6

E6A11. In Figure E6-1, what is the schematic symbol for a P-channel junction FET?
在图E6-1中，P沟道结FET的示意符号是什么?

A. 1 ✓
1
B. 2 ✗
2
C. 3 ✗
3
D. 6 ✗
6

E6A12. Why do many MOSFET devices have internally connected Zener diodes on the gates?
为什么许多MOSFET器件的栅极都有内部连接的齐纳二极管?

A. To provide a voltage reference for the correct amount of reverse-bias gate voltage ✗
为正确量的反向偏置栅极电压提供电压参考
B. To protect the substrate from excessive voltages ✗
保护基板免受过电压的影响
C. To keep the gate voltage within specifications and prevent the device from overheating ✗
保持栅极电压在规格范围内并防止设备过热
D. To reduce the chance of static damage to the gate ✓
减少闸门静态损坏的可能性

E6B Diodes
二极管

E6B01. What is the most useful characteristic of a Zener diode?
齐纳二极管最有用的特性是什么?

A. A constant current drop under conditions of varying voltage ✗
电压变化条件下的恒定电流降
B. A constant voltage drop under conditions of varying current ✓
电流变化条件下的恒定电压降
C. A negative resistance region ✗
负电阻区域
D. An internal capacitance that varies with the applied voltage ✗
随施加电压变化的内部电容

E6B02. What is an important characteristic of a Schottky diode as compared to an ordinary silicon diode when used as a power supply rectifier?
当用作电源整流器时，与普通硅二极管相比，肖特基二极管的重要特性是什么?

A. Much higher reverse voltage breakdown ✗
更高的反向电压击穿
B. More constant reverse avalanche voltage ✗
更恒定的反向雪崩电压
C. Longer carrier retention time ✗
更长的载体保留时间
D. Less forward voltage drop ✓
正向电压降较小

E6B03. What type of bias is required for an LED to emit light?
LED发光需要什么类型的偏置?

A. Reverse bias ✗
反向偏置
B. Forward bias ✓
正向偏置
C. Zero bias ✗
零偏差
D. Inductive bias ✗
归纳偏置

E6B04. What type of semiconductor device is designed for use as a voltage-controlled capacitor?
什么类型的半导体器件被设计用作电压控制电容器?

A. Varactor diode ✓
变容二极管
B. Tunnel diode ✗
隧道二极管
C. Silicon-controlled rectifier ✗
可控硅整流器
D. Zener diode ✗
齐纳二极管

E6B05. What characteristic of a PIN diode makes it useful as an RF switch?
PIN二极管的什么特性使其可用作RF开关?

A. Extremely high reverse breakdown voltage ✗
极高的反向击穿电压
B. Ability to dissipate large amounts of power ✗
消耗大量电力的能力
C. Reverse bias controls its forward voltage drop ✗
反向偏置控制其正向电压降
D. Low junction capacitance ✓
低结电容

E6B06. Which of the following is a common use of a Schottky diode?
以下哪项是肖特基二极管的常用项?

A. As a rectifier in high current power supplies ✗
作为大电流电源中的整流器
B. As a variable capacitance in an automatic frequency control circuit ✗
作为自动频率控制电路中的可变电容
C. As a constant voltage reference in a power supply ✗
作为电源中的恒压参考
D. As a VHF/UHF mixer or detector ✓
作为VHF/UHF混频器或检波器

E6B07. What is the failure mechanism when a junction diode fails due to excessive current?
当结型二极管因电流过大而发生故障时，故障机制是什么?

A. Excessive inverse voltage ✗
反向电压过高
B. Excessive junction temperature ✓
结温过高
C. Insufficient forward voltage ✗
正向电压不足
D. Charge carrier depletion ✗
电荷载流子耗尽

E6B08. Which of the following is a Schottky barrier diode?
以下哪一项是肖特基势垒二极管?

A. Metal-semiconductor junction ✓
金属半导体结
B. Electrolytic rectifier ✗
电解整流器
C. PIN junction ✗
PIN接线
D. Thermionic emission diode ✗
热离子发射二极管

E6B09. What is a common use for point-contact diodes?
点接触二极管的常见用途是什么?

A. As a constant current source ✗
作为恒流源
B. As a constant voltage source ✗
作为恒压源
C. As an RF detector ✓
作为射频探测器
D. As a high-voltage rectifier ✗
作为高压整流器

E6B10. In Figure E6-2, what is the schematic symbol for a light-emitting diode?
在图E6-2中，发光二极管的示意符号是什么?

A. 1 ✗
1
B. 5 ✓
5
C. 6 ✗
6
D. 7 ✗
7

E6B11. What is used to control the attenuation of RF signals by a PIN diode?
PIN二极管用来控制射频信号的衰减的是什么?

A. Forward DC bias current ✓
正向直流偏置电流
B. A sub-harmonic pump signal ✗
次谐波泵浦信号
C. Reverse voltage larger than the RF signal ✗
反向电压大于射频信号
D. Capacitance of an RF coupling capacitor ✗
射频耦合电容器的电容

E6C Digital ICs: Families of digital ICs; gates; Programmable Logic Devices (PLDs)
数字集成电路：数字集成电路系列；闸门；可编程逻辑器件

E6C01. What is the function of hysteresis in a comparator?
比较器中磁滞的作用是什么?

A. To prevent input noise from causing unstable output signals ✓
防止输入噪声导致输出信号不稳定
B. To allow the comparator to be used with AC input signals ✗
允许比较器与交流输入信号一起使用
C. To cause the output to change states continually ✗
使输出不断改变状态
D. To increase the sensitivity ✗
增加灵敏度

E6C02. What happens when the level of a comparator's input signal crosses the threshold?
当比较器的输入信号电平超过阈值时会发生什么?

A. The IC input can be damaged ✗
IC输入可能损坏
B. The comparator changes its output state ✓
比较器改变其输出状态
C. The comparator enters latch-up ✗
比较器进入锁存状态
D. The feedback loop becomes unstable ✗
反馈回路变得不稳定

E6C03. What is tri-state logic?
什么是三态逻辑?

A. Logic devices with 0, 1, and high-impedance output states ✓
具有0、1和高阻抗输出状态的逻辑器件
B. Logic devices that utilize ternary math ✗
利用三元数学的逻辑器件
C. Low-power logic devices designed to operate at 3 volts ✗
设计用于在3伏电压下工作的低功率逻辑器件
D. Proprietary logic devices manufactured by Tri-State Devices ✗
Tri-State devices制造的专有逻辑器件

E6C04. Which of the following is an advantage of BiCMOS logic?
以下哪项是BiCMOS逻辑的优势?

A. Its simplicity results in much less expensive devices than standard CMOS ✗
它的简单性使得器件比标准CMOS便宜得多
B. It is immune to electrostatic damage ✗
它不受静电损伤
C. It has the high input impedance of CMOS and the low output impedance of bipolar transistors ✓
它具有CMOS的高输入阻抗和双极晶体管的低输出阻抗
D. All these choices are correct ✗
所有这些选择都是正确的

E6C05. What is an advantage of CMOS logic devices over TTL devices?
CMOS逻辑器件相对于TTL器件的优势是什么?

A. Differential output capability ✗
差分输出能力
B. Lower distortion ✗
较低失真
C. Immune to damage from static discharge ✗
不受静电放电损伤
D. Lower power consumption ✓
更低的功耗

E6C06. Why do CMOS digital integrated circuits have high immunity to noise on the input signal or power supply?
为什么CMOS数字集成电路对输入信号或电源上的噪声具有高抗扰度?

A. Large bypass capacitance is inherent ✗
大的旁路电容是固有的
B. The input switching threshold is about two times the power supply voltage ✗
输入开关阈值大约是电源电压的两倍
C. The input switching threshold is about one-half the power supply voltage ✓
输入开关阈值大约是电源电压的一半
D. Bandwidth is very limited ✗
带宽非常有限

E6C07. What best describes a pull-up or pull-down resistor?
上拉电阻或下拉电阻的最佳描述是什么?

A. A resistor in a keying circuit used to reduce key clicks ✗
键控电路中的一种电阻器，用于减少按键咔嗒声
B. A resistor connected to the positive or negative supply line used to establish a voltage when an input or output is an open circuit ✓
连接到正极或负极电源线的电阻器，用于在输入或输出开路时建立电压
C. A resistor that ensures that an oscillator frequency does not drift ✗
确保振荡器频率不漂移的电阻器
D. A resistor connected to an op-amp output that prevents signals from exceeding the power supply voltage ✗
连接到运算放大器输出的电阻器，用于防止信号超过电源电压

E6C08. In Figure E6-3, what is the schematic symbol for a NAND gate?
在图E6-3中，NAND门的示意符号是什么?

A. 1 ✗
1
B. 2 ✓
2
C. 3 ✗
3
D. 4 ✗
4

E6C09. What is a Programmable Logic Device (PLD)?
什么是可编程逻辑器件（PLD）?

A. A logic circuit that can be modified during use ✗
在使用过程中可以修改的逻辑电路
B. A programmable collection of logic gates and circuits in a single integrated circuit ✓
单个集成电路中逻辑门和电路的可编程集合
C. Programmable equipment used for testing digital logic integrated circuits ✗
用于测试数字逻辑集成电路的可编程设备
D. A type of transistor whose gain can be changed by digital logic circuits ✗
一种可以通过数字逻辑电路改变增益的晶体管

E6C10. In Figure E6-3, what is the schematic symbol for a NOR gate?
在图E6-3中，NOR门的示意符号是什么?

A. 1 ✗
1
B. 2 ✗
2
C. 3 ✗
3
D. 4 ✓
4

E6C11. In Figure E6-3, what is the schematic symbol for the NOT operation (inverter)?
在图E6-3中，NOT操作（逆变器）的示意符号是什么?

A. 2 ✗
2
B. 4 ✗
4
C. 5 ✓
5
D. 6 ✗
6

E6D Toroidal and Solenoidal Inductors: permeability, core material, selecting, winding; transformers; piezoelectric devices
环形和螺线管电感器：磁导率，核心材料，选择，绕组；变压器；压电器件

E6D01. Why should core saturation of an impedance matching transformer be avoided?
为什么要避免阻抗匹配变压器的铁芯饱和?

A. Harmonics and distortion could result ✓
可能导致谐波和失真
B. Magnetic flux would increase with frequency ✗
磁通量会随频率增加
C. RF susceptance would increase ✗
射频电纳会增加
D. Temporary changes of the core permeability could result ✗
可能导致岩心渗透率的暂时变化

E6D02. What is the equivalent circuit of a quartz crystal?
石英晶体的等效电路是什么?

A. Motional capacitance, motional inductance, and loss resistance in series, all in parallel with a shunt capacitor representing electrode and stray capacitance ✓
串联的运动电容、运动电感和损耗电阻，所有这些都与代表电极和杂散电容的并联电容器并联
B. Motional capacitance, motional inductance, loss resistance, and a capacitor representing electrode and stray capacitance all in parallel ✗
运动电容、运动电感、损耗电阻以及表示电极和杂散电容的电容器均并联
C. Motional capacitance, motional inductance, loss resistance, and a capacitor representing electrode and stray capacitance all in series ✗
运动电容、运动电感、损耗电阻以及代表电极和杂散电容的电容器全部串联
D. Motional inductance and loss resistance in series, paralleled with motional capacitance and a capacitor representing electrode and stray capacitance ✗
串联的运动电感和损耗电阻，与运动电容和代表电极和杂散电容的电容并联

E6D03. Which of the following is an aspect of the piezoelectric effect?
以下哪一项是压电效应的一个方面?

A. Mechanical deformation of material by the application of a voltage ✓
施加电压使材料发生机械变形
B. Mechanical deformation of material by the application of a magnetic field ✗
磁场作用下材料的机械变形
C. Generation of electrical energy in the presence of light ✗
在光的存在下产生电能
D. Increased conductivity in the presence of light ✗
在光的存在下提高导电性

E6D04. Which materials are commonly used as a core in an inductor?
哪些材料通常用作电感器的核心?

A. Polystyrene and polyethylene ✗
聚苯乙烯和聚乙烯
B. Ferrite and brass ✓
铁氧体和黄铜
C. Teflon and Delrin ✗
Teflon和Delrin
D. Cobalt and aluminum ✗
钴和铝

E6D05. What is one reason for using ferrite cores rather than powdered iron in an inductor?
在电感器中使用铁氧体磁芯而不是铁粉的一个原因是什么?

A. Ferrite toroids generally have lower initial permeability ✗
铁氧体环形体通常具有较低的初始磁导率
B. Ferrite toroids generally have better temperature stability ✗
铁氧体环形体通常具有更好的温度稳定性
C. Ferrite toroids generally require fewer turns to produce a given inductance value ✓
铁氧体环形线圈通常需要较少的匝数来产生给定的电感值
D. Ferrite toroids are easier to use with surface mount technology ✗
铁氧体环形线圈更易于使用表面安装技术

E6D06. What core material property determines the inductance of an inductor?
什么样的核心材料特性决定了电感器的电感?

A. Thermal impedance ✗
热阻抗
B. Resistance ✗
反对
C. Reactivity ✗
反应性
D. Permeability ✓
渗透率

E6D07. What is current in the primary winding of a transformer called if no load is attached to the secondary?
如果次级绕组上没有负载，那么变压器初级绕组中的电流是多少?

A. Magnetizing current ✓
磁化电流
B. Direct current ✗
直流
C. Excitation current ✗
励磁电流
D. Stabilizing current ✗
稳定电流

E6D08. What is one reason for using powdered-iron cores rather than ferrite cores in an inductor?
在电感器中使用粉末铁芯而不是铁氧体铁芯的一个原因是什么?

A. Powdered-iron cores generally have greater initial permeability ✗
粉末铁芯通常具有更大的初始磁导率
B. Powdered-iron cores generally maintain their characteristics at higher currents ✓
粉末铁芯通常在较高电流下保持其特性
C. Powdered-iron cores generally require fewer turns to produce a given inductance ✗
粉末铁芯通常需要较少的匝数才能产生给定的电感
D. Powdered-iron cores use smaller diameter wire for the same inductance ✗
粉末铁芯使用较小直径的导线来获得相同的电感

E6D09. What devices are commonly used as VHF and UHF parasitic suppressors at the input and output terminals of a transistor HF amplifier?
晶体管高频放大器的输入和输出端通常使用哪些设备作为VHF和UHF寄生抑制器?

A. Electrolytic capacitors ✗
电解电容器
B. Butterworth filters ✗
巴特沃斯过滤器
C. Ferrite beads ✓
铁氧体磁珠
D. Steel-core toroids ✗
钢芯环面

E6D10. What is a primary advantage of using a toroidal core instead of a solenoidal core in an inductor?
在电感器中使用环形磁芯而不是螺线管磁芯的主要优点是什么?

A. Toroidal cores confine most of the magnetic field within the core material ✓
环形磁芯将大部分磁场限制在磁芯材料内
B. Toroidal cores make it easier to couple the magnetic energy into other components ✗
环形磁芯更容易将磁能耦合到其他部件中
C. Toroidal cores exhibit greater hysteresis ✗
环形磁芯表现出更大的磁滞
D. Toroidal cores have lower Q characteristics ✗
环形铁芯具有较低的Q特性

E6D11. Which type of core material decreases inductance when inserted into a coil?
哪种类型的磁芯材料在插入线圈时会降低电感?

A. Ceramic ✗
陶瓷
B. Brass ✓
黄铜
C. Ferrite ✗
铁氧体
D. Powdered iron ✗
粉末状铁

E6D12. What is inductor saturation?
什么是电感饱和?

A. The inductor windings are over-coupled ✗
电感器绕组过耦合
B. The inductor's voltage rating is exceeded causing a flashover ✗
超过电感器的额定电压导致闪络
C. The ability of the inductor's core to store magnetic energy has been exceeded ✓
电感器的磁芯存储磁能的能力已经超过
D. Adjacent inductors become over-coupled ✗
相邻电感器过度耦合

E6D13. What is the primary cause of inductor self-resonance?
电感器自谐振的主要原因是什么?

A. Inter-turn capacitance ✓
匝间电容
B. The skin effect ✗
皮肤效应
C. Inductive kickback ✗
感应反冲
D. Non-linear core hysteresis ✗
非线性铁芯磁滞

E6E Analog ICs: MMICs, IC packaging characteristics
模拟IC：MMIC，IC封装特性

E6E01. Why is gallium arsenide (GaAs) useful for semiconductor devices operating at UHF and higher frequencies?
为什么砷化镓（GaAs）对工作在UHF和更高频率下的半导体器件有用?

A. Higher noise figures ✗
较高的噪声系数
B. Higher electron mobility ✓
更高的电子迁移率
C. Lower junction voltage drop ✗
较低的结电压降
D. Lower transconductance ✗
更低的跨导

E6E02. Which of the following device packages is a through-hole type?
以下哪种设备封装是通孔型?

A. DIP ✓
倾斜
B. PLCC ✗
C. Ball grid array ✗
球栅阵列
D. SOT ✗

E6E03. Which of the following materials is likely to provide the highest frequency of operation when used in MMICs?
以下哪种材料在MMIC中使用时可能提供最高的工作频率?

A. Silicon ✗
硅
B. Silicon nitride ✗
氮化硅
C. Silicon dioxide ✗
二氧化硅
D. Gallium nitride ✓
氮化镓

E6E04. Which is the most common input and output impedance of circuits that use MMICs?
在使用MMIC的电路中，哪种是最常见的输入和输出阻抗?

A. 50 ohms ✓
50欧姆
B. 300 ohms ✗
300欧姆
C. 450 ohms ✗
450欧姆
D. 10 ohms ✗
10欧姆

E6E05. Which of the following noise figure values is typical of a low-noise UHF preamplifier?
以下哪一个噪声值是低噪声UHF前置放大器的典型值?

A. 2 dB ✓
2分贝
B. -10 dB ✗
-10分贝
C. 44 dBm ✗
D. -20 dBm ✗

E6E06. What characteristics of the MMIC make it a popular choice for VHF through microwave circuits?
MMIC的哪些特性使其成为甚高频微波电路的热门选择?

A. The ability to retrieve information from a single signal even in the presence of other strong signals ✗
即使存在其他强信号，也能从单个信号中检索信息
B. Plate current that is controlled by a control grid ✗
由控制栅控制的板电流
C. Nearly infinite gain, very high input impedance, and very low output impedance ✗
几乎无限增益，非常高的输入阻抗和非常低的输出阻抗
D. Controlled gain, low noise figure, and constant input and output impedance over the specified frequency range ✓
受控增益、低噪声系数以及在指定频率范围内的恒定输入和输出阻抗

E6E07. What type of transmission line is used for connections to MMICs?
什么类型的传输线用于连接MMIC?

A. Miniature coax ✗
微型同轴电缆
B. Circular waveguide ✗
圆形波导管
C. Parallel wire ✗
平行导线
D. Microstrip ✓
微带

E6E08. How is power supplied to the most common type of MMIC?
最常见的MMIC是如何供电的?

A. Through a resistor and/or RF choke connected to the amplifier output lead ✓
通过连接到放大器输出引线的电阻器和/或RF扼流圈
B. MMICs require no operating bias ✗
MMIC不需要操作偏置
C. Through a capacitor and RF choke connected to the amplifier input lead ✗
通过连接到放大器输入引线的电容器和RF扼流圈
D. Directly to the bias voltage (VCC IN) lead ✗
直接连接到偏置电压（VCC IN）引线

E6E09. Which of the following component package types would be most suitable for use at frequencies above the HF range?
以下哪种组件封装类型最适合在HF范围以上的频率下使用?

A. TO-220 ✗
至220
B. Axial lead ✗
轴向引线
C. Radial lead ✗
径向引线
D. Surface mount ✓
表面安装

E6E10. What advantage does surface-mount technology offer at RF compared to using through-hole components?
与使用通孔组件相比，表面安装技术在射频方面有什么优势?

A. Smaller circuit area ✗
较小的电路面积
B. Shorter circuit-board traces ✗
电路板迹线较短
C. Components have less parasitic inductance and capacitance ✗
元件具有较小的寄生电感和电容
D. All these choices are correct ✓
所有这些选择都是正确的

E6E11. What is a characteristic of DIP packaging used for integrated circuits?
用于集成电路的DIP封装的特点是什么?

A. Package mounts in a direct inverted position ✗
封装安装在直接倒置的位置
B. Low leakage doubly insulated package ✗
低泄漏双绝缘封装
C. Two chips in each package (Dual In Package) ✗
每个封装中有两个芯片（双入封装）
D. A total of two rows of connecting pins placed on opposite sides of the package (Dual In-line Package) ✓
共有两排连接引脚放置在封装的相对两侧（双列直插式封装）

E6E12. Why are DIP through-hole package ICs not typically used at UHF and higher frequencies?
为什么DIP通孔封装IC通常不用于UHF和更高频率?

A. Too many pins ✗
引脚过多
B. Epoxy coating is conductive above 300 MHz ✗
环氧涂层在300 MHz以上具有导电性
C. Excessive lead length ✓
导线长度过长
D. Unsuitable for combining analog and digital signals ✗
不适合组合模拟和数字信号

E6F Electro-optical technology: photoconductivity; photovoltaic devices; optical sensors and encoders; optical isolation
电光技术：光电导性；光伏器件；光学传感器和编码器；光学隔离

E6F01. What absorbs the energy from light falling on a photovoltaic cell?
是什么吸收掉在光伏电池上的光的能量?

A. Protons ✗
质子
B. Photons ✗
光子
C. Electrons ✓
电子
D. Holes ✗
孔

E6F02. What happens to the conductivity of a photoconductive material when light shines on it?
当光照在光导材料上时，它的导电性会发生什么变化?

A. It increases ✓
它会增加
B. It decreases ✗
它减少
C. It stays the same ✗
它保持不变
D. It becomes unstable ✗
它变得不稳定

E6F03. What is the most common configuration of an optoisolator or optocoupler?
光隔离器或光耦合器最常见的配置是什么?

A. A lens and a photomultiplier ✗
透镜和光电倍增管
B. A frequency modulated helium-neon laser ✗
调频氦氖激光器
C. An amplitude modulated helium-neon laser ✗
振幅调制氦氖激光器
D. An LED and a phototransistor ✓
一个LED和一个光电晶体管

E6F04. What is the photovoltaic effect?
光伏效应是什么?

A. The conversion of voltage to current when exposed to light ✗
曝光时电压到电流的转换
B. The conversion of light to electrical energy ✓
光到电能的转换
C. The conversion of electrical energy to mechanical energy ✗
电能到机械能的转换
D. The tendency of a battery to discharge when exposed to light ✗
电池暴露在光线下放电的趋势

E6F05. Which describes an optical shaft encoder?
哪个描述了光学轴编码器?

A. A device that detects rotation of a control by interrupting a light source with a patterned wheel ✓
一种通过用带图案的轮子中断光源来检测控件旋转的设备
B. A device that measures the strength of a beam of light using analog to digital conversion ✗
一种使用模数转换来测量光束强度的设备
C. A digital encryption device often used to encrypt spacecraft control signals ✗
一种常用于加密航天器控制信号的数字加密设备
D. A device for generating RTTY signals by means of a rotating light source ✗
一种通过旋转光源产生RTTY信号的装置

E6F06. Which of these materials is most commonly used to create photoconductive devices?
以下哪种材料最常用于制作光电导器件?

A. A crystalline semiconductor ✓
晶体半导体
B. An ordinary metal ✗
一种普通金属
C. A heavy metal ✗
重金属
D. A liquid semiconductor ✗
液体半导体

E6F07. What is a solid-state relay?
什么是固态继电器?

A. A relay using transistors to drive the relay coil ✗
使用晶体管驱动继电器线圈的继电器
B. A device that uses semiconductors to implement the functions of an electromechanical relay ✓
一种使用半导体实现机电继电器功能的装置
C. A mechanical relay that latches in the on or off state each time it is pulsed ✗
一种机械继电器，每次脉冲时都会锁定在打开或关闭状态
D. A semiconductor passive delay line ✗
一种半导体无源延迟线

E6F08. Why are optoisolators often used in conjunction with solid-state circuits when switching 120 VAC?
为什么在切换120 VAC时，光隔离器经常与固态电路结合使用?

A. Optoisolators provide a low impedance link between a control circuit and a power circuit ✗
光隔离器在控制电路和电源电路之间提供低阻抗连接
B. Optoisolators provide impedance matching between the control circuit and power circuit ✗
光隔离器提供控制电路和电源电路之间的阻抗匹配
C. Optoisolators provide a very high degree of electrical isolation between a control circuit and the circuit being switched ✓
光隔离器在控制电路和被切换电路之间提供了非常高的电隔离
D. Optoisolators eliminate the effects of reflected light in the control circuit ✗
光隔离器消除了控制电路中反射光的影响

E6F09. What is the efficiency of a photovoltaic cell?
光伏电池的效率是多少?

A. The output RF power divided by the input DC power ✗
输出射频功率除以输入直流功率
B. Cost per kilowatt-hour generated ✗
每千瓦时发电成本
C. The open-circuit voltage divided by the short-circuit current under full illumination ✗
开路电压除以全照明下的短路电流
D. The relative fraction of light that is converted to current ✓
转换为电流的光的相对分数

E6F10. What is the most common type of photovoltaic cell used for electrical power generation?
用于发电的最常见的光伏电池类型是什么?

A. Selenium ✗
硒
B. Silicon ✓
硅
C. Cadmium Sulfide ✗
硫化镉
D. Copper oxide ✗
氧化铜

E6F11. What is the approximate open-circuit voltage produced by a fully illuminated silicon photovoltaic cell?
全照明硅光伏电池产生的近似开路电压是多少?

A. 0.1 V ✗
0.1伏
B. 0.5 V ✓
0.5伏
C. 1.5 V ✗
1.5伏
D. 12 V ✗
12伏

E7 PRACTICAL CIRCUITS
实用电路

E7A Digital circuits: digital circuit principles and logic circuits; classes of logic elements; positive and negative logic; frequency dividers; truth tables
数字电路：数字电路原理和逻辑电路；逻辑元件的类别；正反逻辑；分频器；真值表

E7A01. Which circuit is bistable?
哪个电路是双稳态的?

A. An AND gate ✗
AND门
B. An OR gate ✗
OR门
C. A flip-flop ✓
触发器
D. A bipolar amplifier ✗
双极放大器

E7A02. What is the function of a decade counter?
十年计数器的功能是什么?

A. It produces one output pulse for every 10 input pulses ✓
它每10个输入脉冲产生一个输出脉冲
B. It decodes a decimal number for display on a seven-segment LED display ✗
它对十进制数字进行解码，以便在七段LED显示屏上显示
C. It produces 10 output pulses for every input pulse ✗
它为每个输入脉冲产生10个输出脉冲
D. It decodes a binary number for display on a seven-segment LED display ✗
它对二进制数字进行解码，以便在七段LED显示器上显示

E7A03. Which of the following can divide the frequency of a pulse train by 2?
以下哪项可以将脉冲串的频率除以2?

A. An XOR gate ✗
XOR门
B. A flip-flop ✓
触发器
C. An OR gate ✗
OR门
D. A multiplexer ✗
多路复用器

E7A04. How many flip-flops are required to divide a signal frequency by 4?
将信号频率除以4需要多少个触发器?

A. 1 ✗
1
B. 2 ✓
2
C. 4 ✗
4
D. 8 ✗
8

E7A05. Which of the following is a circuit that continuously alternates between two states without an external clock?
以下哪一项是在没有外部时钟的情况下在两种状态之间连续交替的电路?

A. Monostable multivibrator ✗
单稳态多谐振荡器
B. J-K flip-flop ✗
J-K触发器
C. T flip-flop ✗
T触发器
D. Astable multivibrator ✓
不稳定多谐振荡器

E7A06. What is a characteristic of a monostable multivibrator?
单稳态多谐振荡器的特性是什么?

A. It switches momentarily to the opposite binary state and then returns to its original state after a set time ✓
它瞬间切换到相反的二进制状态，然后在设定时间后返回到原始状态
B. It produces a continuous square wave oscillating between 1 and 0 ✗
它产生一个在1和0之间振荡的连续方波
C. It stores one bit of data in either a 0 or 1 state ✗
它以0或1状态存储一位数据
D. It maintains a constant output voltage, regardless of variations in the input voltage ✗
无论输入电压如何变化，它都能保持恒定的输出电压

E7A07. What logical operation does a NAND gate perform?
NAND门执行什么逻辑操作?

A. It produces logic 0 at its output only when all inputs are logic 0 ✗
只有当所有输入都为逻辑0时，它才会在输出端产生逻辑0
B. It produces logic 1 at its output only when all inputs are logic 1 ✗
只有当所有输入都为逻辑1时，它才会在输出端产生逻辑1
C. It produces logic 0 at its output if some but not all inputs are logic 1 ✗
如果一些但不是所有的输入都是逻辑1，则在其输出端产生逻辑0
D. It produces logic 0 at its output only when all inputs are logic 1 ✓
只有当所有输入都为逻辑1时，它才会在输出端产生逻辑0

E7A08. What logical operation does an OR gate perform?
或门执行什么逻辑运算?

A. It produces logic 1 at its output if any or all inputs are logic 1 ✓
如果任何或所有输入为逻辑1，则在其输出端产生逻辑1
B. It produces logic 0 at its output if all inputs are logic 1 ✗
如果所有输入均为逻辑1，则在其输出端产生逻辑0
C. It only produces logic 0 at its output when all inputs are logic 1 ✗
当所有输入均为逻辑1时，它仅在输出端产生逻辑0
D. It produces logic 1 at its output if all inputs are logic 0 ✗
如果所有输入均为逻辑0，则在其输出端产生逻辑1

E7A09. What logical operation is performed by an exclusive NOR gate?
异或非门执行什么逻辑运算?

A. It produces logic 0 at its output only if all inputs are logic 0 ✗
只有当所有输入都为逻辑0时，它才会在输出端产生逻辑0
B. It produces logic 1 at its output only if all inputs are logic 1 ✗
只有当所有输入都为逻辑1时，它才会在输出端产生逻辑1
C. It produces logic 0 at its output if only one input is logic 1 ✓
如果只有一个输入为逻辑1，则在其输出端产生逻辑0
D. It produces logic 1 at its output if only one input is logic 1 ✗
如果只有一个输入为逻辑1，则在其输出端产生逻辑1

E7A10. What is a truth table?
什么是真值表?

A. A table of logic symbols that indicate the high logic states of an op-amp ✗
一种逻辑符号表，表示运算放大器的高逻辑状态
B. A diagram showing logic states when the digital device output is true ✗
显示数字设备输出为真时的逻辑状态的图表
C. A list of inputs and corresponding outputs for a digital device ✓
数字设备的输入和相应输出列表
D. A table of logic symbols that indicate the logic states of an op-amp ✗
指示运算放大器逻辑状态的逻辑符号表

E7A11. What type of logic defines "1" as a high voltage?
什么类型的逻辑将“1”定义为高电压?

A. Reverse Logic ✗
反向逻辑
B. Assertive Logic ✗
断言逻辑
C. Negative logic ✗
否定逻辑
D. Positive Logic ✓
正逻辑

E7B Amplifiers: Class of operation; vacuum tube and solid-state circuits; distortion and intermodulation; spurious and parasitic suppression; microwave amplifiers; switching-type amplifiers
放大器：操作类别；真空管和固态电路；失真和互调；杂散和寄生抑制；微波放大器；开关型放大器

E7B01. For what portion of the signal cycle does each active element in a push-pull Class AB amplifier conduct?
推挽式AB类放大器中的每个有源元件在信号周期的哪个部分导通?

A. More than 180 degrees but less than 360 degrees ✓
大于180度但小于360度
B. Exactly 180 degrees ✗
正好180度
C. The entire cycle ✗
整个周期
D. Less than 180 degrees ✗
小于180度

E7B02. What is a Class D amplifier?
什么是D类放大器?

A. A type of amplifier that uses switching technology to achieve high efficiency ✓
一种使用开关技术实现高效率的放大器
B. A low power amplifier that uses a differential amplifier for improved linearity ✗
一种使用差分放大器以提高线性度的低功率放大器
C. An amplifier that uses drift-mode FETs for high efficiency ✗
一种使用漂移模式FET实现高效率的放大器
D. A frequency doubling amplifier ✗
倍频放大器

E7B03. Which of the following components form the output of a class D amplifier circuit?
下列哪个部件构成D类放大器电路的输出?

A. A low-pass filter to remove switching signal components ✓
用于去除开关信号分量的低通滤波器
B. A high-pass filter to compensate for low gain at low frequencies ✗
一种高通滤波器，用于补偿低频时的低增益
C. A matched load resistor to prevent damage by switching transients ✗
一个匹配的负载电阻器，用于防止开关瞬态造成的损坏
D. A temperature compensating load resistor to improve linearity ✗
一种用于提高线性度的温度补偿负载电阻器

E7B04. Where on the load line of a Class A common emitter amplifier would bias normally be set?
在a类共射极放大器的负载线上，通常会在哪里设置偏置?

A. Approximately halfway between saturation and cutoff ✓
大约介于饱和和截止之间
B. Where the load line intersects the voltage axis ✗
负载线与电压轴相交的位置
C. At a point where the bias resistor equals the load resistor ✗
在偏置电阻器等于负载电阻器的点处
D. At a point where the load line intersects the zero bias current curve ✗
在负载线与零偏置电流曲线相交的点处

E7B05. What can be done to prevent unwanted oscillations in an RF power amplifier?
如何防止射频功率放大器出现不必要的振荡?

A. Tune the stage for maximum SWR ✗
调整舞台以获得最大SWR
B. Tune both the input and output for maximum power ✗
调整输入和输出以获得最大功率
C. Install parasitic suppressors and/or neutralize the stage ✓
安装寄生抑制器和/或使级中和
D. Use a phase inverter in the output filter ✗
在输出滤波器中使用倒相器

E7B06. Which of the following amplifier types reduces even-order harmonics?
以下哪种放大器类型可降低偶次谐波?

A. Push-push ✗
推-推
B. Push-pull ✓
推拉
C. Class C ✗
C类
D. Class AB ✗
AB类

E7B07. Which of the following is a likely result when a Class C amplifier is used to amplify a single-sideband phone signal?
当C类放大器用于放大单边带电话信号时，以下哪一项可能是结果?

A. Reduced intermodulation products ✗
减少互调产物
B. Increased overall intelligibility ✗
提高整体清晰度
C. Signal inversion ✗
信号反转
D. Signal distortion and excessive bandwidth ✓
信号失真和带宽过大

E7B08. How can an RF power amplifier be neutralized?
如何对射频功率放大器进行中和?

A. By increasing the driving power ✗
通过增加驱动力
B. By reducing the driving power ✗
通过降低驱动功率
C. By feeding a 180-degree out-of-phase portion of the output back to the input ✓
通过将输出的180度异相部分反馈回输入
D. By feeding an in-phase component of the output back to the input ✗
通过将输出的同相分量反馈给输入

E7B09. Which of the following describes how the loading and tuning capacitors are to be adjusted when tuning a vacuum tube RF power amplifier that employs a Pi-network output circuit?
以下哪一项描述了在调谐采用Pi网络输出电路的真空管RF功率放大器时如何调整负载和调谐电容器?

A. The loading capacitor is set to maximum capacitance and the tuning capacitor is adjusted for minimum allowable plate current ✗
负载电容器设置为最大电容，调谐电容器调整为最小允许板电流
B. The tuning capacitor is set to maximum capacitance and the loading capacitor is adjusted for minimum plate permissible current ✗
调谐电容器设置为最大电容，负载电容器调整为最小板允许电流
C. The loading capacitor is adjusted to minimum plate current while alternately adjusting the tuning capacitor for maximum allowable plate current ✗
负载电容器被调节到最小板电流，同时交替地调节调谐电容器到最大允许板电流
D. The tuning capacitor is adjusted for minimum plate current, and the loading capacitor is adjusted for maximum permissible plate current ✓
调谐电容器被调整为最小板电流，负载电容器被调节为最大允许板电流

E7B10. In Figure E7-1, what is the purpose of R1 and R2?
在图E7-1中，R1和R2的用途是什么?

A. Load resistors ✗
负载电阻器
B. Voltage divider bias ✓
分压器偏置
C. Self bias ✗
自我偏见
D. Feedback ✗
反馈

E7B11. In Figure E7-1, what is the purpose of R3?
在图E7-1中，R3的用途是什么?

A. Fixed bias ✗
固定偏置
B. Emitter bypass ✗
发射器旁路
C. Output load resistor ✗
输出负载电阻器
D. Self bias ✓
自我偏见

E7B12. What type of amplifier circuit is shown in Figure E7-1?
图E7-1中显示了哪种类型的放大器电路?

A. Common base ✗
公共基础
B. Common collector ✗
公用收集器
C. Common emitter ✓
公共发射器
D. Emitter follower ✗
发射器跟随器

E7B13. Which of the following describes an emitter follower (or common collector) amplifier?
以下哪项描述了射极跟随器（或共集电极）放大器?

A. A two-transistor amplifier with the emitters sharing a common bias resistor ✗
发射极共用一个公共偏置电阻器的双晶体管放大器
B. A differential amplifier with both inputs fed to the emitter of the input transistor ✗
一种差分放大器，两个输入端都被馈送到输入晶体管的发射极
C. An OR circuit with only one emitter used for output ✗
只有一个发射极用于输出的OR电路
D. An amplifier with a low impedance output that follows the base input voltage ✓
一种具有低阻抗输出的放大器，其输出跟随基本输入电压

E7B14. Why are switching amplifiers more efficient than linear amplifiers?
为什么开关放大器比线性放大器更有效率?

A. Switching amplifiers operate at higher voltages ✗
开关放大器在较高电压下工作
B. The power transistor is at saturation or cutoff most of the time ✓
功率晶体管大部分时间处于饱和或截止状态
C. Linear amplifiers have high gain resulting in higher harmonic content ✗
线性放大器具有高增益，从而产生更高的谐波含量
D. Switching amplifiers use push-pull circuits ✗
开关放大器使用推挽电路

E7B15. What is one way to prevent thermal runaway in a bipolar transistor amplifier?
在双极晶体管放大器中，防止热失控的一种方法是什么?

A. Neutralization ✗
中和
B. Select transistors with high beta ✗
选择高β晶体管
C. Use a resistor in series with the emitter ✓
使用与发射器串联的电阻器
D. All these choices are correct ✗
所有这些选择都是正确的

E7B16. What is the effect of intermodulation products in a linear power amplifier?
线性功率放大器中互调产物的影响是什么?

A. Transmission of spurious signals ✓
杂散信号的传输
B. Creation of parasitic oscillations ✗
寄生振荡的产生
C. Low efficiency ✗
效率低
D. All these choices are correct ✗
所有这些选择都是正确的

E7B17. Why are odd-order rather than even-order intermodulation distortion products of concern in linear power amplifiers?
为什么在线性功率放大器中关注奇数阶而不是偶数阶互调失真产物?

A. Because they are relatively close in frequency to the desired signal ✓
因为它们的频率与所需信号相对接近
B. Because they are relatively far in frequency from the desired signal ✗
因为它们的频率与所需信号的距离相对较远
C. Because they invert the sidebands causing distortion ✗
因为它们反转边带导致失真
D. Because they maintain the sidebands, thus causing multiple duplicate signals ✗
因为它们保持边带，从而导致多个重复信号

E7B18. What is a characteristic of a grounded-grid amplifier?
接地栅极放大器的特性是什么?

A. High power gain ✗
高功率增益
B. High filament voltage ✗
灯丝电压高
C. Low input impedance ✓
低输入阻抗
D. Low bandwidth ✗
低带宽

E7C Filters and matching networks: types of networks; types of filters; filter applications; filter characteristics; impedance matching; DSP filtering
过滤器和匹配网络：网络类型；过滤器类型；过滤器应用；滤波器特性；阻抗匹配；DSP滤波

E7C01. How are the capacitors and inductors of a low-pass filter Pi-network arranged between the network's input and output?
低通滤波器Pi网络的电容器和电感器是如何布置在网络的输入和输出之间的?

A. Two inductors are in series between the input and output, and a capacitor is connected between the two inductors and ground ✗
两个电感器串联在输入和输出之间，一个电容器连接在两个电阻器和地之间
B. Two capacitors are in series between the input and output, and an inductor is connected between the two capacitors and ground ✗
两个电容器串联在输入和输出之间，一个电感器连接在两个电容和地之间
C. An inductor is connected between the input and ground, another inductor is connected between the output and ground, and a capacitor is connected between the input and output ✗
一个电感器连接在输入和地之间，另一个电阻器连接在输出和地之间
D. A capacitor is connected between the input and ground, another capacitor is connected between the output and ground, and an inductor is connected between input and output ✓
一个电容器连接在输入和地之间，另一个电容连接在输出和地之间。电感器连接在输出与输入之间

E7C02. Which of the following is a property of a T-network with series capacitors and a parallel shunt inductor?
以下哪项是具有串联电容器和并联并联电感器的T型网络的特性?

A. It is a low-pass filter ✗
它是一个低通滤波器
B. It is a band-pass filter ✗
这是一个带通滤波器
C. It is a high-pass filter ✓
这是一个高通滤波器
D. It is a notch filter ✗
这是一个陷波滤波器

E7C03. What advantage does a series-L Pi-L-network have over a series-L Pi-network for impedance matching between the final amplifier of a vacuum-tube transmitter and an antenna?
在真空管发射器的最终放大器和天线之间的阻抗匹配方面，L系列Pi-L网络比L系列Pi网络有什么优势?

A. Greater harmonic suppression ✓
更大的谐波抑制
B. Higher efficiency ✗
更高的效率
C. Does not require a capacitor ✗
不需要电容器
D. Greater transformation range ✗
更大的转换范围

E7C04. How does an impedance-matching circuit transform a complex impedance to a resistive impedance?
阻抗匹配电路如何将复阻抗转换为电阻阻抗?

A. It introduces negative resistance to cancel the resistive part of impedance ✗
它引入负电阻来抵消阻抗的电阻部分
B. It introduces transconductance to cancel the reactive part of impedance ✗
它引入跨导来抵消阻抗的电抗部分
C. It cancels the reactive part of the impedance and changes the resistive part to a desired value ✓
它取消了阻抗的电抗部分，并将电阻部分更改为所需值
D. Reactive currents are dissipated in matched resistances ✗
无功电流在匹配的电阻中耗散

E7C05. Which filter type is described as having ripple in the passband and a sharp cutoff?
哪种滤波器类型被描述为通带中具有波纹和尖锐截止?

A. A Butterworth filter ✗
巴特沃斯滤波器
B. An active LC filter ✗
有源LC滤波器
C. A passive op-amp filter ✗
无源运算放大器滤波器
D. A Chebyshev filter ✓
切比雪夫滤波器

E7C06. What are the distinguishing features of an elliptical filter?
椭圆滤波器的显著特征是什么?

A. Gradual passband rolloff with minimal stop band ripple ✗
带阻纹波最小的渐变通带滚降
B. Extremely flat response over its pass band with gradually rounded stop band corners ✗
通带上的响应非常平坦，阻带角逐渐变圆
C. Extremely sharp cutoff with one or more notches in the stop band ✓
在阻带上有一个或多个缺口的非常锋利的切口
D. Gradual passband rolloff with extreme stop band ripple ✗
带极端阻带波纹的渐变通带滚降

E7C07. Which describes a Pi-L-network used for matching a vacuum tube final amplifier to a 50-ohm unbalanced output?
哪个描述了用于将真空管最终放大器与50欧姆不平衡输出匹配的Pi-L网络?

A. A Phase Inverter Load network ✗
A相逆变器负载网络
B. A Pi-network with an additional series inductor on the output ✓
Pi网络，输出端有一个额外的串联电感器
C. A network with only three discrete parts ✗
只有三个分立部分的网络
D. A matching network in which all components are isolated from ground ✗
所有组件均与地面隔离的匹配网络

E7C08. Which of the following factors has the greatest effect on the bandwidth and response shape of a crystal ladder filter?
以下哪个因素对晶体梯形滤波器的带宽和响应形状的影响最大?

A. The relative frequencies of the individual crystals ✓
单个晶体的相对频率
B. The DC voltage applied to the quartz crystal ✗
施加在石英晶体上的直流电压
C. The gain of the RF stage preceding the filter ✗
滤波器前RF级的增益
D. The amplitude of the signals passing through the filter ✗
通过滤波器的信号幅度

E7C09. What is a crystal lattice filter?
什么是晶格滤波器?

A. A power supply filter made with interlaced quartz crystals ✗
一种由交错石英晶体制成的电源滤波器
B. An audio filter made with four quartz crystals that resonate at 1kHz intervals ✗
由四个石英晶体制成的音频滤波器，以1kHz的频率谐振
C. A filter using lattice-shaped quartz crystals for high-Q performance ✗
一种使用晶格状石英晶体实现高Q性能的滤波器
D. A filter with narrow bandwidth and steep skirts made using quartz crystals ~~ ✓
一种使用石英晶体制成的具有窄带宽和陡峭裙板的滤波器 ~~

E7C10. Which of the following filters would be the best choice for use in a 2 meter band repeater duplexer?
以下哪种滤波器是2米波段中继器双工器的最佳选择?

A. A crystal filter ✗
晶体滤波器
B. A cavity filter ✓
空腔过滤器
C. A DSP filter ✗
DSP滤波器
D. An L-C filter ✗
L-C滤波器

E7C11. Which of the following describes a receiving filter's ability to reject signals occupying an adjacent channel?
以下哪项描述了接收滤波器拒绝占用相邻信道的信号的能力?

A. Passband ripple ✗
通带波纹
B. Phase response ✗
相位响应
C. Shape factor ✓
形状因子
D. Noise factor ✗
噪声系数

E7C12. What is one advantage of a Pi-matching network over an L-matching network consisting of a single inductor and a single capacitor?
Pi匹配网络相对于由单个电感器和单个电容器组成的L匹配网络的优势是什么?

A. The Q of Pi-networks can be controlled ✓
Pi网络的Q可以控制
B. L-networks cannot perform impedance transformation ✗
L-网络不能进行阻抗变换
C. Pi-networks are more stable ✗
Pi网络更稳定
D. Pi-networks provide balanced input and output ✗
Pi网络提供平衡的输入和输出

E7D Power supplies and voltage regulators; Solar array charge controllers
电源和电压调节器；太阳能电池阵列充电控制器

E7D01. How does a linear electronic voltage regulator work?
线性电子电压调节器是如何工作的?

A. It has a ramp voltage as its output ✗
它的输出是斜坡电压
B. It eliminates the need for a pass transistor ✗
它消除了对传输晶体管的需要
C. The control element duty cycle is proportional to the line or load conditions ✗
控制元件占空比与线路或负载条件成比例
D. The conduction of a control element is varied to maintain a constant output voltage ✓
改变控制元件的导通以保持恒定的输出电压

E7D02. What is a characteristic of a switching electronic voltage regulator?
开关式电子电压调节器的特性是什么?

A. The resistance of a control element is varied in direct proportion to the line voltage or load current ✗
控制元件的电阻与线路电压或负载电流成正比地变化
B. It is generally less efficient than a linear regulator ✗
它的效率通常低于线性调节器
C. The controlled device's duty cycle is changed to produce a constant average output voltage ✓
受控设备的占空比被改变以产生恒定的平均输出电压
D. It gives a ramp voltage at its output ✗
它在输出端提供斜坡电压

E7D03. What device is typically used as a stable voltage reference in a linear voltage regulator?
什么设备通常用作线性电压调节器中的稳定电压参考?

A. A Zener diode ✓
齐纳二极管
B. A tunnel diode ✗
隧道二极管
C. An SCR ✗
SCR
D. A varactor diode ✗
变容二极管

E7D04. Which of the following types of linear voltage regulator usually make the most efficient use of the primary power source?
以下哪种类型的线性电压调节器通常最有效地利用主电源?

A. A series current source ✗
A系列电流源
B. A series regulator ✓
A系列调节器
C. A shunt regulator ✗
并联调节器
D. A shunt current source ✗
分流电流源

E7D05. Which of the following types of linear voltage regulator places a constant load on the unregulated voltage source?
以下哪种类型的线性电压调节器在未调节的电压源上放置恒定负载?

A. A constant current source ✗
恒流源
B. A series regulator ✗
A系列调节器
C. A shunt current source ✗
分流电流源
D. A shunt regulator ✓
并联调节器

E7D06. What is the purpose of Q1 in the circuit shown in Figure E7-2?
图E7-2所示电路中Q1的用途是什么?

A. It provides negative feedback to improve regulation ✗
它提供负面反馈以改善监管
B. It provides a constant load for the voltage source ✗
它为电压源提供恒定负载
C. It controls the current supplied to the load ✓
它控制提供给负载的电流
D. It provides D1 with current ✗
它为D1提供电流

E7D07. What is the purpose of C2 in the circuit shown in Figure E7-2?
图E7-2所示电路中C2的用途是什么?

A. It bypasses rectifier output ripple around D1 ✓
它绕过D1周围的整流器输出纹波
B. It is a brute force filter for the output ✗
它是输出的强力过滤器
C. To self-resonate at the hum frequency ✗
在嗡嗡声频率下自谐振
D. To provide fixed DC bias for Q1 ✗
为Q1提供固定的直流偏压

E7D08. What type of circuit is shown in Figure E7-2?
图E7-2中显示了哪种类型的电路?

A. Switching voltage regulator ✗
开关电压调节器
B. Grounded emitter amplifier ✗
接地发射极放大器
C. Linear voltage regulator ✓
线性电压调节器
D. Monostable multivibrator ✗
单稳态多谐振荡器

E7D09. What is the main reason to use a charge controller with a solar power system?
在太阳能系统中使用充电控制器的主要原因是什么?

A. Prevention of battery undercharge ✗
防止蓄电池充电不足
B. Control of electrolyte levels during battery discharge ✗
蓄电池放电过程中的电解液液位控制
C. Prevention of battery damage due to overcharge ✓
防止因过度充电而损坏蓄电池
D. Matching of day and night charge rates ✗
昼夜收费率匹配

E7D10. What is the primary reason that a high-frequency switching type high-voltage power supply can be both less expensive and lighter in weight than a conventional power supply?
高频开关型高压电源比传统电源既便宜又轻的主要原因是什么?

A. The inverter design does not require any output filtering ✗
逆变器设计不需要任何输出滤波
B. It uses a diode bridge rectifier for increased output ✗
它使用二极管桥式整流器来增加输出
C. The high frequency inverter design uses much smaller transformers and filter components for an equivalent power output ✓
高频逆变器的设计使用更小的变压器和滤波器组件来实现等效功率输出
D. It uses a large power factor compensation capacitor to recover power from the unused portion of the AC cycle ✗
它使用一个大功率因数补偿电容器来从交流循环的未使用部分恢复功率

E7D11. What is the function of the pass transistor in a linear voltage regulator circuit?
线性电压调节器电路中的传输晶体管的功能是什么?

A. Permits a wide range of output voltage settings ✗
允许广泛的输出电压设置
B. Provides a stable input impedance over a wide range of source voltage ✗
在宽电源电压范围内提供稳定的输入阻抗
C. Maintains nearly constant output impedance over a wide range of load current ✗
在宽负载电流范围内保持几乎恒定的输出阻抗
D. Maintains nearly constant output voltage over a wide range of load current ✓
在宽负载电流范围内保持几乎恒定的输出电压

E7D12. What is the dropout voltage of an analog voltage regulator?
模拟电压调节器的压降是多少?

A. Minimum input voltage for rated power dissipation ✗
额定功耗的最小输入电压
B. Maximum output voltage drops when the input voltage is varied over its specified range ✗
当输入电压在其指定范围内变化时，最大输出电压下降
C. Minimum input-to-output voltage required to maintain regulation ✓
维持调节所需的最小输入输出电压
D. Maximum that the output voltage may decrease at rated load ✗
输出电压在额定负载下可能降低的最大值

E7D13. What is the equation for calculating power dissipated by a series linear voltage regulator?
计算串联线性电压调节器耗散功率的方程式是什么?

A. Input voltage multiplied by input current ✗
输入电压乘以输入电流
B. Input voltage divided by output current ✗
输入电压除以输出电流
C. Voltage difference from input to output multiplied by output current ✓
输入到输出的电压差乘以输出电流
D. Output voltage multiplied by output current ✗
输出电压乘以输出电流

E7D14. What is the purpose of connecting equal-value resistors across power supply filter capacitors connected in series?
在串联的电源滤波电容器之间连接等值电阻器的目的是什么?

A. Equalize the voltage across each capacitor ✗
均衡每个电容器上的电压
B. Discharge the capacitors when voltage is removed ✗
消除电压后，使电容器放电
C. Provide a minimum load on the supply ✗
在电源上提供最小负载
D. All these choices are correct ✓
所有这些选择都是正确的

E7D15. What is the purpose of a step-start circuit in a high-voltage power supply?
高压电源中的步进启动电路的用途是什么?

A. To provide a dual-voltage output for reduced power applications ✗
为低功耗应用提供双电压输出
B. To compensate for variations of the incoming line voltage ✗
补偿进线电压的变化
C. To allow for remote control of the power supply ✗
允许远程控制电源
D. To allow the filter capacitors to charge gradually ✓
使滤波电容器逐渐充电

E7E Modulation and demodulation: reactance, phase and balanced modulators; detectors; mixer stages
调制解调：电抗、相位、平衡调制器；探测器；混合器级

E7E01. Which of the following can be used to generate FM phone emissions?
以下哪项可用于产生调频电话发射?

A. A balanced modulator on the audio amplifier ✗
音频放大器上的平衡调制器
B. A reactance modulator on the oscillator ✓
振荡器上的电抗调制器
C. A reactance modulator on the final amplifier ✗
末级放大器上的电抗调制器
D. A balanced modulator on the oscillator ✗
振荡器上的平衡调制器

E7E02. What is the function of a reactance modulator?
电抗调制器的功能是什么?

A. To produce PM signals by using an electrically variable resistance ✗
使用可变电阻产生PM信号
B. To produce AM signals by using an electrically variable inductance or capacitance ✗
使用可变电感或电容产生AM信号
C. To produce AM signals by using an electrically variable resistance ✗
使用可变电阻产生AM信号
D. To produce PM or FM signals by using an electrically variable inductance or capacitance ✓
通过使用可变电感或电容产生PM或FM信号

E7E03. What is a frequency discriminator stage in a FM receiver?
调频接收机中的鉴频级是什么?

A. An FM generator circuit ✗
调频发生器电路
B. A circuit for filtering two closely adjacent signals ✗
一种对两个相邻信号进行滤波的电路
C. An automatic band-switching circuit ✗
一种自动波段切换电路
D. A circuit for detecting FM signals ✓
一种用于检测调频信号的电路

E7E04. What is one way a single-sideband phone signal can be generated?
产生单边带电话信号的一种方法是什么?

A. By using a balanced modulator followed by a filter ✓
通过使用平衡调制器和滤波器
B. By using a reactance modulator followed by a mixer ✗
通过使用电抗调制器和混频器
C. By using a loop modulator followed by a mixer ✗
通过使用环路调制器和混频器
D. By driving a product detector with a DSB signal ✗
通过用DSB信号驱动产品检测器

E7E05. What circuit is added to an FM transmitter to boost the higher audio frequencies?
调频发射机增加了什么电路来提高更高的音频频率?

A. A de-emphasis network ✗
去加重网络
B. A heterodyne suppressor ✗
外差抑制器
C. A heterodyne enhancer ✗
外差增强器
D. A pre-emphasis network ✓
预加重网络

E7E06. Why is de-emphasis commonly used in FM communications receivers?
为什么调频通信接收机通常使用去加重?

A. For compatibility with transmitters using phase modulation ✓
与使用相位调制的变送器兼容
B. To reduce impulse noise reception ✗
减少脉冲噪声接收
C. For higher efficiency ✗
为了获得更高的效率
D. To remove third-order distortion products ✗
去除三阶失真产物

E7E07. What is meant by the term "baseband" in radio communications?
无线电通信中的“基带”是什么意思?

A. The lowest frequency band that the transmitter or receiver covers ✗
发射机或接收机覆盖的最低频带
B. The frequency range occupied by a message signal prior to modulation ✓
调制前消息信号占用的频率范围
C. The unmodulated bandwidth of the transmitted signal ✗
传输信号的未调制带宽
D. The basic oscillator frequency in an FM transmitter that is multiplied to increase the deviation and carrier frequency ✗
调频发射机中的基本振荡器频率，它被相乘以增加偏差和载波频率

E7E08. What are the principal frequencies that appear at the output of a mixer circuit?
混频器电路输出端出现的主频率是多少?

A. Two and four times the original frequency ✗
原始频率的两到四倍
B. The square root of the product of input frequencies ✗
输入频率乘积的平方根
C. The two input frequencies along with their sum and difference frequencies ✓
两个输入频率及其和频和差频
D. 1.414 and 0.707 times the input frequency ✗
输入频率的1.414和0.707倍

E7E09. What occurs when an excessive amount of signal energy reaches a mixer circuit?
当过量的信号能量到达混频器电路时会发生什么?

A. Spurious mixer products are generated ✓
产生虚假的混合器产品
B. Mixer blanking occurs ✗
混合器出现下料
C. Automatic limiting occurs ✗
发生自动限制
D. A beat frequency is generated ✗
生成拍频

E7E10. How does a diode envelope detector function?
二极管包络检波器是如何工作的?

A. By rectification and filtering of RF signals ✓
通过RF信号的整流和滤波
B. By breakdown of the Zener voltage ✗
通过齐纳电压的击穿
C. By mixing signals with noise in the transition region of the diode ✗
通过在二极管的过渡区将信号与噪声混合
D. By sensing the change of reactance in the diode with respect to frequency ✗
通过感应二极管中电抗相对于频率的变化

E7E11. Which type of detector circuit is used for demodulating SSB signals?
哪种类型的检测器电路用于解调SSB信号?

A. Discriminator ✗
鉴别器
B. Phase detector ✗
相位检测器
C. Product detector ✓
产品检测器
D. Phase comparator ✗
相位比较器

E7F DSP filtering and other operations; software defined radio fundamentals; DSP modulation and demodulation
DSP滤波等操作；软件定义的无线电基础；DSP调制解调

E7F01. What is meant by direct digital conversion as applied to software defined radios?
应用于软件定义无线电的直接数字转换是什么意思?

A. Software is converted from source code to object code during operation of the receiver ✗
在接收器操作期间，软件从源代码转换为目标代码
B. Incoming RF is converted to a control voltage for a voltage controlled oscillator ✗
输入RF被转换为压控振荡器的控制电压
C. Incoming RF is digitized by an analog-to-digital converter without being mixed with a local oscillator signal ✓
输入RF由模数转换器数字化，而不与本地振荡器信号混合
D. A switching mixer is used to generate I and Q signals directly from the RF input ✗
开关混频器用于直接从RF输入产生I和Q信号

E7F02. What kind of digital signal processing audio filter is used to remove unwanted noise from a received SSB signal?
什么样的数字信号处理音频滤波器用于从接收到的SSB信号中去除不需要的噪声?

A. An adaptive filter ✓
自适应滤波器
B. A crystal-lattice filter ✗
晶格滤波器
C. A Hilbert-transform filter ✗
希尔伯特变换滤波器
D. A phase-inverting filter ✗
反相滤波器

E7F03. What type of digital signal processing filter is used to generate an SSB signal?
什么类型的数字信号处理滤波器用于生成SSB信号?

A. An adaptive filter ✗
自适应滤波器
B. A notch filter ✗
陷波滤波器
C. A Hilbert-transform filter ✓
希尔伯特变换滤波器
D. An elliptical filter ✗
椭圆滤波器

E7F04. What is a common method of generating an SSB signal using digital signal processing?
使用数字信号处理生成SSB信号的常见方法是什么?

A. Mixing products are converted to voltages and subtracted by adder circuits ✗
混合产物被转换为电压，并由加法器电路减去
B. A frequency synthesizer removes the unwanted sidebands ✗
频率合成器去除不需要的边带
C. Varying quartz crystal characteristics emulated in digital form ✗
以数字形式模拟变化的石英晶体特性
D. Signals are combined in quadrature phase relationship ✓
信号以正交相位关系组合

E7F05. How frequently must an analog signal be sampled by an analog-to-digital converter so that the signal can be accurately reproduced?
模拟-数字转换器必须多久对模拟信号进行一次采样，才能准确地再现信号?

A. At least half the rate of the highest frequency component of the signal ✗
信号最高频率分量的速率的至少一半
B. At least twice the rate of the highest frequency component of the signal ✓
至少是信号最高频率分量速率的两倍
C. At the same rate as the highest frequency component of the signal ✗
以与信号的最高频率分量相同的速率
D. At four times the rate of the highest frequency component of the signal ✗
以信号最高频率分量的四倍速率

E7F06. What is the minimum number of bits required for an analog-to-digital converter to sample a signal with a range of 1 volt at a resolution of 1 millivolt?
模数转换器以1毫伏的分辨率对1伏范围的信号进行采样所需的最小位数是多少?

A. 4 bits ✗
4位
B. 6 bits ✗
6位
C. 8 bits ✗
8位
D. 10 bits ✓
10位

E7F07. What function is performed by a Fast Fourier Transform?
快速傅立叶变换执行什么功能?

A. Converting analog signals to digital form ✗
将模拟信号转换为数字形式
B. Converting digital signals to analog form ✗
将数字信号转换为模拟形式
C. Converting digital signals from the time domain to the frequency domain ✓
将数字信号从时域转换到频域
D. Converting 8-bit data to 16-bit data ✗
将8位数据转换为16位数据

E7F08. What is the function of decimation?
抽取的功能是什么?

A. Converting data to binary code decimal form ✗
将数据转换为二进制代码-十进制形式
B. Reducing the effective sample rate by removing samples ✓
通过移除样本降低有效采样率
C. Attenuating the signal ✗
减弱信号
D. Removing unnecessary significant digits ✗
删除不必要的有效数字

E7F09. Why is an anti-aliasing digital filter required in a digital decimator?
为什么在数字抽取器中需要抗混叠数字滤波器?

A. It removes high-frequency signal components that would otherwise be reproduced as lower frequency components ✓
它去除了高频信号分量，否则这些分量将被再现为低频分量
B. It peaks the response of the decimator, improving bandwidth ✗
它使抽取器的响应达到峰值，提高了带宽
C. It removes low-frequency signal components to eliminate the need for DC restoration ✗
它去除了低频信号分量，消除了直流恢复的需要
D. It notches out the sampling frequency to avoid sampling errors ✗
它降低了采样频率以避免采样误差

E7F10. What aspect of receiver analog-to-digital conversion determines the maximum receive bandwidth of a Direct Digital Conversion SDR?
接收器模数转换的哪个方面决定了直接数字转换SDR的最大接收带宽?

A. Sample rate ✓
采样率
B. Sample width in bits ✗
样本宽度（以位为单位）
C. Sample clock phase noise ✗
采样时钟相位噪声
D. Processor latency ✗
处理器延迟

E7F11. What sets the minimum detectable signal level for a direct-sampling SDR receiver in the absence of atmospheric or thermal noise?
在没有大气或热噪声的情况下，是什么设置了直接采样SDR接收器的最小可检测信号电平?

A. Sample clock phase noise ✗
采样时钟相位噪声
B. Reference voltage level and sample width in bits ✓
参考电压电平和采样宽度（以位为单位）
C. Data storage transfer rate ✗
数据存储传输速率
D. Missing codes and jitter ✗
代码缺失和抖动

E7F12. Which of the following is an advantage of a Finite Impulse Response (FIR) filter vs an Infinite Impulse Response (IIR) digital filter?
以下哪项是有限脉冲响应（FIR）滤波器与无限脉冲响应（IIR）数字滤波器的优势?

A. FIR filters can delay all frequency components of the signal by the same amount ✓
FIR滤波器可以将信号的所有频率分量延迟相同的量
B. FIR filters are easier to implement for a given set of passband rolloff requirements ✗
对于给定的一组通带滚降要求，FIR滤波器更容易实现
C. FIR filters can respond faster to impulses ✗
FIR滤波器可以更快地响应脉冲
D. All these choices are correct ✗
所有这些选择都是正确的

E7F13. What is the function of taps in a digital signal processing filter?
数字信号处理滤波器中抽头的功能是什么?

A. To reduce excess signal pressure levels ✗
降低过量信号压力水平
B. Provide access for debugging software ✗
提供调试软件的访问权限
C. Select the point at which baseband signals are generated ✗
选择生成基带信号的点
D. Provide incremental signal delays for filter algorithms ✓
为滤波器算法提供增量信号延迟

E7F14. Which of the following would allow a digital signal processing filter to create a sharper filter response?
以下哪项可以使数字信号处理滤波器产生更清晰的滤波器响应?

A. Higher data rate ✗
更高的数据速率
B. More taps ✓
更多抽头
C. Complex phasor representations ✗
复数相量表示
D. Double-precision math routines ✗
双精度数学例程

E7G Active filters and op-amp circuits: active audio filters; characteristics; basic circuit design; operational amplifiers
有源滤波器和运算放大器电路：有源音频滤波器；特征；基本电路设计；运算放大器

E7G01. What is the typical output impedance of an op-amp?
运算放大器的典型输出阻抗是多少?

A. Very low ✓
非常低
B. Very high ✗
非常高
C. 100 ohms ✗
100欧姆
D. 1000 ohms ✗
1000欧姆

E7G02. What is ringing in a filter?
过滤器中的铃声是什么?

A. An echo caused by a long time delay ✗
长时间延迟引起的回声
B. A reduction in high frequency response ✗
高频响应降低
C. Partial cancellation of the signal over a range of frequencies ✗
在一定频率范围内对信号进行部分抵消
D. Undesired oscillations added to the desired signal ✓
添加到所需信号的不希望的振荡

E7G03. What is the typical input impedance of an op-amp?
运算放大器的典型输入阻抗是多少?

A. 100 ohms ✗
100欧姆
B. 1000 ohms ✗
1000欧姆
C. Very low ✗
非常低
D. Very high ✓
非常高

E7G04. What is meant by the "op-amp input offset voltage"?
“运算放大器输入偏移电压”是什么意思?

A. The output voltage of the op-amp minus its input voltage ✗
运算放大器的输出电压减去其输入电压
B. The difference between the output voltage of the op-amp and the input voltage required in the immediately following stage ✗
运算放大器的输出电压与下一级所需的输入电压之间的差值
C. The differential input voltage needed to bring the open loop output voltage to zero ✓
使开环输出电压为零所需的差分输入电压
D. The potential between the amplifier input terminals of the op-amp in an open loop condition ✗
开环条件下运算放大器的放大器输入端子之间的电位

E7G05. How can unwanted ringing and audio instability be prevented in an op-amp RC audio filter circuit?
如何在运算放大器RC音频滤波器电路中防止不必要的振铃和音频不稳定?

A. Restrict both gain and Q ✓
限制增益和Q
B. Restrict gain but increase Q ✗
限制增益但增加Q
C. Restrict Q but increase gain ✗
限制Q但增加增益
D. Increase both gain and Q ✗
增加增益和Q

E7G06. What is the gain-bandwidth of an operational amplifier?
运算放大器的增益带宽是多少?

A. The maximum frequency for a filter circuit using that type of amplifier ✗
使用该类型放大器的滤波器电路的最大频率
B. The frequency at which the open-loop gain of the amplifier equals one ✓
放大器开环增益等于1的频率
C. The gain of the amplifier at a filter's cutoff frequency ✗
滤波器截止频率下放大器的增益
D. The frequency at which the amplifier's offset voltage is zero ✗
放大器偏移电压为零的频率

E7G07. What magnitude of voltage gain can be expected from the circuit in Figure E7 3 when R1 is 10 ohms and RF is 470 ohms?
当R1为10欧姆，RF为470欧姆时，图E7 3中的电路可以预期电压增益的大小?

A. 0.21 ✗
0.21
B. 94 ✗
94
C. 47 ✓
47
D. 24 ✗
24

E7G08. How does the gain of an ideal operational amplifier vary with frequency?
理想运算放大器的增益如何随频率变化?

A. It increases linearly with increasing frequency ✗
它随着频率的增加而线性增加
B. It decreases linearly with increasing frequency ✗
它随着频率的增加而线性下降
C. It decreases logarithmically with increasing frequency ✗
它随着频率的增加呈对数递减
D. It does not vary with frequency ✓
它不随频率变化

E7G09. What will be the output voltage of the circuit shown in Figure E7-3 if R1 is 1000 ohms, RF is 10,000 ohms, and 0.23 volts DC is applied to the input?
如果R1为1000欧姆，RF为10000欧姆，并且0.23伏直流电施加到输入端，那么图E7-3所示电路的输出电压是多少?

A. 0.23 volts ✗
0.23伏
B. 2.3 volts ✗
2.3伏
C. -0.23 volts ✗
-0.23伏
D. -2.3 volts ✓
-2.3伏

E7G10. What absolute voltage gain can be expected from the circuit in Figure E7-3 when R1 is 1800 ohms and RF is 68 kilohms?
当R1为1800欧姆，RF为68千欧姆时，图E7-3中电路的绝对电压增益是多少?

A. 1 ✗
1
B. 0.03 ✗
0.03
C. 38 ✓
38
D. 76 ✗
76

E7G11. What absolute voltage gain can be expected from the circuit in Figure E7-3 when R1 is 3300 ohms and RF is 47 kilohms?
当R1为3300欧姆，RF为47千欧姆时，图E7-3中电路的绝对电压增益是多少?

A. 28 ✗
28
B. 14 ✓
14
C. 7 ✗
7
D. 0.07 ✗
0.07

E7G12. What is an operational amplifier?
什么是运算放大器?

A. A high-gain, direct-coupled differential amplifier with very high input impedance and very low output impedance ✓
一种高增益、直接耦合的差分放大器，具有非常高的输入阻抗和非常低的输出阻抗
B. A digital audio amplifier whose characteristics are determined by components external to the amplifier ✗
一种数字音频放大器，其特性由放大器外部的组件决定
C. An amplifier used to increase the average output of frequency modulated amateur signals to the legal limit ✗
一种放大器，用于将调频业余信号的平均输出提高到法定限度
D. A RF amplifier used in the UHF and microwave regions ✗
用于超高频和微波区域的RF放大器

E7H Oscillators and signal sources: types of oscillators; synthesizers and phase-locked loops; direct digital synthesizers; stabilizing thermal drift; microphonics; high-accuracy oscillators
振荡器和信号源：振荡器的类型；合成器和锁相环；直接数字合成器；稳定热漂移；微电子学；高精度振荡器

E7H01. What are three oscillator circuits used in amateur radio equipment?
业余无线电设备中使用的三个振荡器电路是什么?

A. Taft, Pierce and negative feedback ✗
塔夫脱、皮尔斯和负面反馈
B. Pierce, Fenner and Beane ✗
皮尔斯、芬纳和比恩
C. Taft, Hartley and Pierce ✗
塔夫脱、哈特利和皮尔斯
D. Colpitts, Hartley and Pierce ✓
科尔皮茨、哈特利和皮尔斯

E7H02. What is a microphonic?
什么是麦克风?

A. An IC used for amplifying microphone signals ✗
一种用于放大麦克风信号的IC
B. Distortion caused by RF pickup on the microphone cable ✗
麦克风电缆上的RF拾波引起的失真
C. Changes in oscillator frequency due to mechanical vibration ✓
机械振动引起的振荡器频率变化
D. Excess loading of the microphone by an oscillator ✗
振荡器对麦克风的过度负载

E7H03. How is positive feedback supplied in a Hartley oscillator?
哈特利振荡器是如何提供正反馈的?

A. Through a tapped coil ✓
通过抽头线圈
B. Through a capacitive divider ✗
通过电容分压器
C. Through link coupling ✗
贯穿联轴节
D. Through a neutralizing capacitor ✗
通过中和电容器

E7H04. How is positive feedback supplied in a Colpitts oscillator?
如何在Colpitts振荡器中提供正反馈?

A. Through a tapped coil ✗
通过抽头线圈
B. Through link coupling ✗
贯穿联轴节
C. Through a capacitive divider ✓
通过电容分压器
D. Through a neutralizing capacitor ✗
通过中和电容器

E7H05. How is positive feedback supplied in a Pierce oscillator?
皮尔斯振荡器是如何提供正反馈的?

A. Through a tapped coil ✗
通过抽头线圈
B. Through link coupling ✗
贯穿联轴节
C. Through a neutralizing capacitor ✗
通过中和电容器
D. Through a quartz crystal ✓
透过石英晶体

E7H06. Which of the following oscillator circuits are commonly used in VFOs?
以下哪种振荡器电路通常用于VFO?

A. Pierce and Zener ✗
皮尔斯和齐纳
B. Colpitts and Hartley ✓
Colpitts和Hartley
C. Armstrong and deForest ✗
阿姆斯特朗和德福雷斯特
D. Negative feedback and balanced feedback ✗
非正面反馈和平衡反馈

E7H07. How can an oscillator's microphonic responses be reduced?
如何降低振荡器的微音响应?

A. Use NP0 capacitors ✗
使用NP0电容器
B. Reduce noise on the oscillator's power supply ✗
降低振荡器电源上的噪声
C. Increase the bias voltage ✗
增加偏置电压
D. Mechanically isolate the oscillator circuitry from its enclosure ✓
将振荡器电路与其外壳机械隔离

E7H08. Which of the following components can be used to reduce thermal drift in crystal oscillators?
以下哪种组件可用于减少晶体振荡器中的热漂移?

A. NP0 capacitors ✓
NP0电容器
B. Toroidal inductors ✗
环形电感器
C. Wirewound resistors ✗
线绕电阻器
D. Non-inductive resistors ✗
无感电阻器

E7H09. What type of frequency synthesizer circuit uses a phase accumulator, lookup table, digital to analog converter, and a low-pass anti-alias filter?
什么类型的频率合成器电路使用相位累加器、查找表、数模转换器和低通抗混叠滤波器?

A. A direct digital synthesizer ✓
一种直接数字合成器
B. A hybrid synthesizer ✗
一种混合合成器
C. A phase-locked loop synthesizer ✗
一种锁相环合成器
D. A diode-switching matrix synthesizer ✗
一种二极管开关矩阵合成器

E7H10. What information is contained in the lookup table of a direct digital synthesizer (DDS)?
直接数字合成器（DDS）的查找表中包含哪些信息?

A. The phase relationship between a reference oscillator and the output waveform ✗
参考振荡器和输出波形之间的相位关系
B. Amplitude values that represent the desired waveform ✓
表示所需波形的振幅值
C. The phase relationship between a voltage-controlled oscillator and the output waveform ✗
压控振荡器与输出波形之间的相位关系
D. Frequently used receiver and transmitter frequencies ✗
常用的接收机和发射机频率

E7H11. What are the major spectral impurity components of direct digital synthesizers?
直接数字合成器的主要光谱杂质成分是什么?

A. Broadband noise ✗
宽带噪声
B. Digital conversion noise ✗
数字转换噪声
C. Spurious signals at discrete frequencies ✓
离散频率的杂散信号
D. Nyquist limit noise ✗
奈奎斯特极限噪声

E7H12. Which of the following must be done to ensure that a crystal oscillator provides the frequency specified by the crystal manufacturer?
必须执行以下哪项操作才能确保晶体振荡器提供晶体制造商规定的频率?

A. Provide the crystal with a specified parallel inductance ✗
为晶体提供指定的并联电感
B. Provide the crystal with a specified parallel capacitance ✓
为晶体提供指定的并联电容
C. Bias the crystal at a specified voltage ✗
在指定电压下偏置晶体
D. Bias the crystal at a specified current ✗
以指定电流偏置晶体

E7H13. Which of the following is a technique for providing highly accurate and stable oscillators needed for microwave transmission and reception?
以下哪项是提供微波发射和接收所需的高精度和稳定振荡器的技术?

A. Use a GPS signal reference ✗
使用GPS信号参考
B. Use a rubidium stabilized reference oscillator ✗
使用铷稳定的参考振荡器
C. Use a temperature-controlled high Q dielectric resonator ✗
使用温度控制的高Q介质谐振器
D. All these choices are correct ✓
所有这些选择都是正确的

E7H14. What is a phase-locked loop circuit?
什么是锁相环电路?

A. An electronic servo loop consisting of a ratio detector, reactance modulator, and voltage-controlled oscillator ✗
一种由比率检测器、电抗调制器和压控振荡器组成的电子伺服回路
B. An electronic circuit also known as a monostable multivibrator ✗
一种也称为单稳态多谐振荡器的电子电路
C. An electronic servo loop consisting of a phase detector, a low-pass filter, a voltage-controlled oscillator, and a stable reference oscillator ✓
一种电子伺服回路，由相位检测器、低通滤波器、压控振荡器和稳定参考振荡器组成
D. An electronic circuit consisting of a precision push-pull amplifier with a differential input ✗
一种由具有差分输入的精密推挽放大器组成的电子电路

E7H15. Which of these functions can be performed by a phase-locked loop?
锁相环可以执行以下哪些功能?

A. Wide-band AF and RF power amplification ✗
宽带AF和RF功率放大
B. Comparison of two digital input signals, digital pulse counter ✗
两个数字输入信号的比较，数字脉冲计数器
C. Photovoltaic conversion, optical coupling ✗
光伏转换、光耦合
D. Frequency synthesis, FM demodulation ✓
频率合成、调频解调

E8 SIGNALS AND EMISSIONS
信号和排放

E8A AC waveforms: sine, square, and irregular waveforms; AC measurements; average power and PEP of RF signals; Fourier analysis; analog to digital conversion: digital to analog conversion; advantages of digital communications
交流波形：正弦、方形和不规则波形；交流测量；RF信号的平均功率和PEP；傅立叶分析；模数转换：数模转换；数字通信的优势

E8A01. What is the name of the process that shows that a square wave is made up of a sine wave plus all its odd harmonics?
方波由正弦波加上其所有奇次谐波组成的过程的名称是什么?

A. Fourier analysis ✓
傅立叶分析
B. Vector analysis ✗
矢量分析
C. Numerical analysis ✗
数值分析
D. Differential analysis ✗
差异分析

E8A02. Which of the following is a type of analog-to-digital conversion?
以下哪项是一种模数转换?

A. Successive approximation ✓
逐次逼近
B. Harmonic regeneration ✗
谐波再生
C. Level shifting ✗
水平移动
D. Phase reversal ✗
相位反转

E8A03. What type of wave does a Fourier analysis show to be made up of sine waves of a given fundamental frequency plus all its harmonics?
傅立叶分析表明，哪种类型的波是由给定基频的正弦波加上其所有谐波组成的?

A. A sawtooth wave ✓
锯齿波
B. A square wave ✗
方波
C. A sine wave ✗
正弦波
D. A cosine wave ✗
余弦波

E8A04. What is "dither" with respect to analog-to-digital converters?
关于模数转换器，什么是“抖动”?

A. An abnormal condition where the converter cannot settle on a value to represent the signal ✗
转换器无法确定表示信号的值的异常情况
B. A small amount of noise added to the input signal to allow more precise representation of a signal over time ✓
添加到输入信号中的少量噪声，以允许随着时间的推移更精确地表示信号
C. An error caused by irregular quantization step size ✗
由不规则量化步长引起的误差
D. A method of decimation by randomly skipping samples ✗
一种随机跳过样本的抽取方法

E8A05. What of the following instruments would be the most accurate for measuring the RMS voltage of a complex waveform?
以下哪种仪器对测量复杂波形的RMS电压最准确?

A. A grid dip meter ✗
网格倾角计
B. A D'Arsonval meter ✗
达松瓦尔流量计
C. An absorption wave meter ✗
吸收式波长计
D. A true-RMS calculating meter ✓
真正的RMS计算仪表

E8A06. What is the approximate ratio of PEP-to-average power in a typical single-sideband phone signal?
在典型的单边带电话信号中，PEP与平均功率的近似比率是多少?

A. 2.5 to 1 ✓
2.5到1
B. 25 to 1 ✗
25比1
C. 1 to 1 ✗
1到1
D. 100 to 1 ✗
100到1

E8A07. What determines the PEP-to-average power ratio of a single-sideband phone signal?
是什么决定了单边带电话信号的PEP与平均功率比?

A. The frequency of the modulating signal ✗
调制信号的频率
B. Speech characteristics ✓
语音特征
C. The degree of carrier suppression ✗
载波抑制程度
D. Amplifier gain ✗
放大器增益

E8A08. Why would a direct or flash conversion analog-to-digital converter be useful for a software defined radio?
为什么直接或闪存转换模数转换器对软件定义的收音机有用?

A. Very low power consumption decreases frequency drift ✗
非常低的功耗降低了频率漂移
B. Immunity to out-of-sequence coding reduces spurious responses ✗
抗序列外编码降低杂散响应
C. Very high speed allows digitizing high frequencies ✓
非常高的速度允许数字化高频
D. All these choices are correct ✗
所有这些选择都是正确的

E8A09. How many different input levels can be encoded by an analog-to-digital converter with 8-bit resolution?
一个8位分辨率的模数转换器可以编码多少个不同的输入电平?

A. 8 ✗
8
B. 8 multiplied by the gain of the input amplifier ✗
8乘以输入放大器的增益
C. 256 divided by the gain of the input amplifier ✗
256除以输入放大器的增益
D. 256 ✓
256

E8A10. What is the purpose of a low-pass filter used in conjunction with a digital-to-analog converter?
低通滤波器与数模转换器结合使用的目的是什么?

A. Lower the input bandwidth to increase the effective resolution ✗
降低输入带宽以提高有效分辨率
B. Improve accuracy by removing out-of-sequence codes from the input ✗
通过从输入中删除无序代码来提高准确性
C. Remove harmonics from the output caused by the discrete analog levels generated ✓
消除由产生的离散模拟电平引起的输出谐波
D. All these choices are correct ✗
所有这些选择都是正确的

E8A11. Which of the following is a measure of the quality of an analog-to-digital converter?
以下哪项是衡量模数转换器质量的指标?

A. Total harmonic distortion ✓
总谐波失真
B. Peak envelope power ✗
峰值包络功率
C. Reciprocal mixing ✗
往复混合
D. Power factor ✗
功率因数

E8B Modulation and demodulation: modulation methods; modulation index and deviation ratio; frequency and time division multiplexing; Orthogonal Frequency Division Multiplexing
调制解调：调制方式；调制指数和偏差率；频分和时分复用；正交频分复用

E8B01. What is the modulation index of an FM signal?
调频信号的调制指数是多少?

A. The ratio of frequency deviation to modulating signal frequency ✓
频率偏差与调制信号频率之比
B. The ratio of modulating signal amplitude to frequency deviation ✗
调制信号振幅与频率偏差之比
C. The type of modulation used by the transmitter ✗
发射机使用的调制类型
D. The bandwidth of the transmitted signal divided by the modulating signal frequency ✗
传输信号的带宽除以调制信号频率

E8B02. How does the modulation index of a phase-modulated emission vary with RF carrier frequency?
相位调制发射的调制指数如何随RF载波频率而变化?

A. It increases as the RF carrier frequency increases ✗
它随着射频载波频率的增加而增加
B. It decreases as the RF carrier frequency increases ✗
它随着RF载波频率的增加而减小
C. It varies with the square root of the RF carrier frequency ✗
它随RF载波频率的平方根而变化
D. It does not depend on the RF carrier frequency ✓
它不取决于射频载波频率

E8B03. What is the modulation index of an FM-phone signal having a maximum frequency deviation of 3000 Hz either side of the carrier frequency when the modulating frequency is 1000 Hz?
当调制频率为1000赫兹时，调频电话信号在载波频率两侧的最大频率偏差为3000赫兹，其调制指数是多少?

A. 3 ✓
3
B. 0.3 ✗
0.3
C. 3000 ✗
3000
D. 1000 ✗
1000

E8B04. What is the modulation index of an FM-phone signal having a maximum carrier deviation of plus or minus 6 kHz when modulated with a 2 kHz modulating frequency?
当用2kHz调制频率调制时，最大载波偏差为正或负6kHz的调频电话信号的调制指数是多少?

A. 6000 ✗
6000
B. 3 ✓
3
C. 2000 ✗
2000
D. 1/3 ✗

E8B05. What is the deviation ratio of an FM-phone signal having a maximum frequency swing of plus-or-minus 5 kHz when the maximum modulation frequency is 3 kHz?
当最大调制频率为3kHz时，最大频率摆动为正负5kHz的调频电话信号的偏差率是多少?

A. 60 ✗
60
B. 0.167 ✗
0.167
C. 0.6 ✗
0.6
D. 1.67 ✓
1.67

E8B06. What is the deviation ratio of an FM-phone signal having a maximum frequency swing of plus or minus 7.5 kHz when the maximum modulation frequency is 3.5 kHz?
当最大调制频率为3.5kHz时，具有正或负7.5kHz的最大频率摆动的调频电话信号的偏差比是多少?

A. 2.14 ✓
2.14
B. 0.214 ✗
0.214
C. 0.47 ✗
0.47
D. 47 ✗
47

E8B07. Orthogonal Frequency Division Multiplexing is a technique used for which type of amateur communication?
正交频分复用是一种用于哪种类型的业余通信的技术?

A. High-speed digital modes ✓
高速数字模式
B. Extremely low-power contacts ✗
极低功率触点
C. EME ✗
D. OFDM signals are not allowed on amateur bands ✗
业余频段不允许使用OFDM信号

E8B08. What describes Orthogonal Frequency Division Multiplexing?
什么描述正交频分复用?

A. A frequency modulation technique that uses non-harmonically related frequencies ✗
一种使用非谐波相关频率的频率调制技术
B. A bandwidth compression technique using Fourier transforms ✗
一种使用傅立叶变换的带宽压缩技术
C. A digital mode for narrow-band, slow-speed transmissions ✗
窄带低速传输的数字模式
D. A digital modulation technique using subcarriers at frequencies chosen to avoid intersymbol interference ✓
一种数字调制技术，使用频率选择为避免符号间干扰的子载波

E8B09. What is deviation ratio?
偏差率是多少?

A. The ratio of the audio modulating frequency to the center carrier frequency ✗
音频调制频率与中心载波频率的比率
B. The ratio of the maximum carrier frequency deviation to the highest audio modulating frequency ✓
最大载波频率偏差与最高音频调制频率的比率
C. The ratio of the carrier center frequency to the audio modulating frequency ✗
载波中心频率与音频调制频率之比
D. The ratio of the highest audio modulating frequency to the average audio modulating frequency ✗
最高音频调制频率与平均音频调制频率的比率

E8B10. What is frequency division multiplexing?
什么是频分复用?

A. The transmitted signal jumps from band to band at a predetermined rate ✗
发射的信号以预定的速率从一个频带跳到另一个频带
B. Two or more information streams are merged into a baseband, which then modulates the transmitter ✓
两个或多个信息流被合并到基带中，然后基带对发射机进行调制
C. The transmitted signal is divided into packets of information ✗
传输的信号被分成信息包
D. Two or more information streams are merged into a digital combiner, which then pulse position modulates the transmitter ✗
两个或多个信息流被合并到数字组合器中，然后数字组合器对发射机进行脉冲位置调制

E8B11. What is digital time division multiplexing?
什么是数字时分复用?

A. Two or more data streams are assigned to discrete sub-carriers on an FM transmitter ✗
两个或多个数据流被分配给FM发射机上的离散子载波
B. Two or more signals are arranged to share discrete time slots of a data transmission ✓
两个或多个信号被安排为共享数据传输的离散时隙
C. Two or more data streams share the same channel by transmitting time of transmission as the sub-carrier ✗
两个或多个数据流通过传输时间作为子载波共享同一信道
D. Two or more signals are quadrature modulated to increase bandwidth efficiency ✗
对两个或多个信号进行正交调制以提高带宽效率

E8C Digital signals: digital communication modes; information rate vs. bandwidth; error correction
数字信号：数字通信方式；信息速率与带宽的关系；误差校正

E8C01. How is Forward Error Correction implemented?
前向纠错是如何实现的?

A. By the receiving station repeating each block of three data characters ✗
通过接收站重复三个数据字符的每个块
B. By transmitting a special algorithm to the receiving station along with the data characters ✗
通过将特殊算法与数据字符一起发送到接收站
C. By transmitting extra data that may be used to detect and correct transmission errors ✓
通过传输可用于检测和纠正传输错误的额外数据
D. By varying the frequency shift of the transmitted signal according to a predefined algorithm ✗
通过根据预定义的算法改变发射信号的频移

E8C02. What is the definition of symbol rate in a digital transmission?
数字传输中符号率的定义是什么?

A. The number of control characters in a message packet ✗
消息包中的控制字符数
B. The duration of each bit in a message sent over the air ✗
通过空中传送的消息中每个比特的持续时间
C. The rate at which the waveform changes to convey information ✓
波形改变以传递信息的速率
D. The number of characters carried per second by the station-to-station link ✗
站点到站点链接每秒携带的字符数

E8C03. Why should phase-shifting of a PSK signal be done at the zero crossing of the RF signal?
为什么PSK信号的相移应该在RF信号的零交叉处进行?

A. To minimize bandwidth ✓
最小化带宽
B. To simplify modulation ✗
简化调制
C. To improve carrier suppression ✗
提高载波抑制
D. All these choices are correct ✗
所有这些选择都是正确的

E8C04. What technique minimizes the bandwidth of a PSK31 signal?
什么技术可以最大限度地减少PSK31信号的带宽?

A. Zero-sum character encoding ✗
零和字符编码
B. Reed-Solomon character encoding ✗
Reed-Solomon字符编码
C. Use of sinusoidal data pulses ✓
正弦数据脉冲的使用
D. Use of trapezoidal data pulses ✗
梯形数据脉冲的使用

E8C05. What is the approximate bandwidth of a 13-WPM International Morse Code transmission?
13-WPM国际莫尔斯电码传输的大致带宽是多少?

A. 13 Hz ✗
13赫兹
B. 26 Hz ✗
26赫兹
C. 52 Hz ✓
52赫兹
D. 104 Hz ✗
104赫兹

E8C06. What is the bandwidth of a 170-hertz shift, 300-baud ASCII transmission?
170赫兹移位、300波特ASCII传输的带宽是多少?

A. 0.1 Hz ✗
0.1赫兹
B. 0.3 kHz ✗
0.3千赫
C. 0.5 kHz ✓
0.5千赫
D. 1.0 kHz ✗
1.0千赫

E8C07. What is the bandwidth of a 4800-Hz frequency shift, 9600-baud ASCII FM transmission?
4800赫兹频移、9600波特ASCII FM传输的带宽是多少?

A. 15.36 kHz ✓
15.36千赫
B. 9.6 kHz ✗
9.6千赫
C. 4.8 kHz ✗
4.8千赫
D. 5.76 kHz ✗
5.76千赫

E8C08. How does ARQ accomplish error correction?
ARQ如何完成纠错?

A. Special binary codes provide automatic correction ✗
特殊二进制代码提供自动校正
B. Special polynomial codes provide automatic correction ✗
特殊多项式代码提供自动校正
C. If errors are detected, redundant data is substituted ✗
如果检测到错误，则替换冗余数据
D. If errors are detected, a retransmission is requested ✓
如果检测到错误，则请求重新传输

E8C09. Which digital code allows only one bit to change between sequential code values?
哪种数字代码只允许一位在顺序代码值之间变化?

A. Binary Coded Decimal Code ✗
二进制编码的十进制代码
B. Extended Binary Coded Decimal Interchange Code ✗
扩展二进制编码十进制交换码
C. Excess 3 code ✗
超额3代码
D. Gray code ✓
格雷码

E8C10. How may symbol rate be increased without increasing bandwidth?
如何在不增加带宽的情况下增加符号率?

A. It is impossible ✗
这是不可能的
B. Increasing analog-to-digital conversion resolution ✗
提高模数转换分辨率
C. Using a more efficient digital code ✓
使用更高效的数字代码
D. Using forward error correction ✗
使用前向纠错

E8C11. What is the relationship between symbol rate and baud?
符号速率和波特率之间的关系是什么?

A. They are the same ✓
他们是一样的
B. Baud is twice the symbol rate ✗
波特率是符号速率的两倍
C. Symbol rate is only used for packet-based modes ✗
符号率仅用于基于数据包的模式
D. Baud is only used for RTTY ✗
波特仅用于RTTY

E8C12. What factors affect the bandwidth of a transmitted CW signal?
哪些因素会影响传输的CW信号的带宽?

A. IF bandwidth and Q ✗
中频带宽和Q
B. Modulation index and output power ✗
调制指数和输出功率
C. Keying speed and shape factor (rise and fall time) ✓
键控速度和形状因子（上升和下降时间）
D. All these choices are correct ✗
所有这些选择都是正确的

E8D Keying defects and overmodulation of digital signals; digital codes; spread spectrum
数字信号的键控缺陷和过调制；数字编码；扩频

E8D01. Why are received spread spectrum signals resistant to interference?
为什么接收到的扩频信号具有抗干扰性?

A. Signals not using the spread spectrum algorithm are suppressed in the receiver ✓
未使用扩频算法的信号在接收器中被抑制
B. The high power used by a spread spectrum transmitter keeps its signal from being easily overpowered ✗
扩频发射机使用的高功率使其信号不容易被压倒
C. The receiver is always equipped with a digital blanker ✗
接收器总是配有数字消隐器
D. If interference is detected by the receiver it will signal the transmitter to change frequencies ✗
如果接收机检测到干扰，它将向发射机发送信号以改变频率

E8D02. What spread spectrum communications technique uses a high-speed binary bit stream to shift the phase of an RF carrier?
什么扩频通信技术使用高速二进制比特流来移动RF载波的相位?

A. Frequency hopping ✗
跳频
B. Direct sequence ✓
直接序列
C. Binary phase-shift keying ✗
二进制移相键控
D. Phase compandored spread spectrum ✗
相位压扩扩频

E8D03. How does the spread spectrum technique of frequency hopping work?
跳频的扩频技术是如何工作的?

A. If interference is detected by the receiver it will signal the transmitter to change frequencies ✗
如果接收机检测到干扰，它将向发射机发送信号以改变频率
B. If interference is detected by the receiver it will signal the transmitter to wait until the frequency is clear ✗
如果接收器检测到干扰，它将向发射器发出信号，等待频率清除
C. A binary bit stream is used to shift the phase of an RF carrier very rapidly in a pseudorandom sequence ✗
二进制比特流用于在伪随机序列中非常快速地移动RF载波的相位
D. The frequency of the transmitted signal is changed very rapidly according to a pseudorandom sequence also used by the receiving station ✓
根据接收站也使用的伪随机序列，发射信号的频率变化非常快

E8D04. What is the primary effect of extremely short rise or fall time on a CW signal?
极短的上升或下降时间对CW信号的主要影响是什么?

A. More difficult to copy ✗
更难复制
B. The generation of RF harmonics ✗
射频谐波的产生
C. The generation of key clicks ✓
按键点击的生成
D. Limits data speed ✗
限制数据速度

E8D05. What is the most common method of reducing key clicks?
减少按键点击的最常见方法是什么?

A. Increase keying waveform rise and fall times ✓
增加键控波形的上升和下降时间
B. Low-pass filters at the transmitter output ✗
变送器输出处的低通滤波器
C. Reduce keying waveform rise and fall times ✗
减少键控波形的上升和下降时间
D. High-pass filters at the transmitter output ✗
变送器输出处的高通滤波器

E8D06. What is the advantage of including parity bits in ASCII characters?
在ASCII字符中包含奇偶校验位的优点是什么?

A. Faster transmission rate ✗
更快的传输速率
B. The signal can overpower interfering signals ✗
该信号可以压倒干扰信号
C. Foreign language characters can be sent ✗
可以发送外语字符
D. Some types of errors can be detected ✓
可以检测到某些类型的错误

E8D07. What is a common cause of overmodulation of AFSK signals?
AFSK信号过调制的常见原因是什么?

A. Excessive numbers of retries ✗
重试次数过多
B. Ground loops ✗
接地回路
C. Bit errors in the modem ✗
调制解调器中的位错误
D. Excessive transmit audio levels ✓
传输音频电平过高

E8D08. What parameter evaluates distortion of an AFSK signal caused by excessive input audio levels?
什么参数评估输入音频电平过高导致的AFSK信号失真?

A. Signal-to-noise ratio ✗
信噪比
B. Baud rate ✗
波特率
C. Repeat Request Rate (RRR) ✗
重复请求率
D. Intermodulation Distortion (IMD) ✓
互调失真

E8D09. What is considered an acceptable maximum IMD level for an idling PSK signal?
怠速PSK信号的可接受最大IMD水平是多少?

A. +10 dB ✗
+10分贝
B. +15 dB ✗
+15分贝
C. -20 dB ✗
-20分贝
D. -30 dB ✓
-30分贝

E8D10. What are some of the differences between the Baudot digital code and ASCII?
Baudot数字代码和ASCII之间有哪些区别?

A. Baudot uses 4 data bits per character, ASCII uses 7 or 8; Baudot uses 1 character as a letters/figures shift code, ASCII has no letters/figures code ✗
Baudot每个字符使用4个数据位，ASCII使用7或8个；Baudot使用1个字符作为字母/数字移位码，ASCII没有字母/数字码
B. Baudot uses 5 data bits per character, ASCII uses 7 or 8; Baudot uses 2 characters as letters/figures shift codes, ASCII has no letters/figures shift code ✓
Baudot每个字符使用5个数据位，ASCII使用7或8个；Baudot使用2个字符作为字母/数字的移位码，ASCII没有字母/数字移位码
C. Baudot uses 6 data bits per character, ASCII uses 7 or 8; Baudot has no letters/figures shift code, ASCII uses 2 letters/figures shift codes ✗
Baudot每个字符使用6个数据位，ASCII使用7或8个；Baudot没有字母/数字移位码，ASCII使用2个字母/数字的移位码
D. Baudot uses 7 data bits per character, ASCII uses 8; Baudot has no letters/figures shift code, ASCII uses 2 letters/figures shift codes ✗
Baudot每个字符使用7个数据位，ASCII使用8个；Baudot没有字母/数字移位码，ASCII使用2个字母/数字的移位码

E8D11. What is one advantage of using ASCII code for data communications?
使用ASCII码进行数据通信的一个优点是什么?

A. It includes built-in error correction features ✗
它包括内置的纠错功能
B. It contains fewer information bits per character than any other code ✗
它每个字符包含的信息位比任何其他代码都少
C. It is possible to transmit both upper and lower case text ✓
可以同时传输大写和小写文本
D. It uses one character as a shift code to send numeric and special characters ✗
它使用一个字符作为移位码来发送数字字符和特殊字符

E9 ANTENNAS AND TRANSMISSION LINES
天线和传输线

E9A Basic Antenna parameters: radiation resistance, gain, beamwidth, efficiency; effective radiated power
天线基本参数：辐射电阻、增益、波束宽度、效率；有效辐射功率

E9A01. What is an isotropic antenna?
什么是各向同性天线?

A. A grounded antenna used to measure Earth conductivity ✗
用于测量地球电导率的接地天线
B. A horizontally polarized antenna used to compare Yagi antennas ✗
一种用于比较八木天线的水平极化天线
C. A theoretical, omnidirectional antenna used as a reference for antenna gain ✓
一种理论上的全向天线，用作天线增益的参考
D. A spacecraft antenna used to direct signals toward Earth ✗
一种用于将信号导向地球的航天器天线

E9A02. What is the effective radiated power relative to a dipole of a repeater station with 150 watts transmitter power output, 2 dB feed line loss, 2.2 dB duplexer loss, and 7 dBd antenna gain?
相对于发射机功率输出为150瓦、馈线损耗为2 dB、双工器损耗为2.2 dB、天线增益为7 dBd的中继站的偶极子，有效辐射功率是多少?

A. 1977 watts ✗
1977瓦
B. 78.7 watts ✗
78.7瓦
C. 420 watts ✗
420瓦
D. 286 watts ✓
286瓦

E9A03. What is the radiation resistance of an antenna?
天线的辐射电阻是多少?

A. The combined losses of the antenna elements and feed line ✗
天线元件和馈线的组合损耗
B. The specific impedance of the antenna ✗
天线的比阻抗
C. The value of a resistance that would dissipate the same amount of power as that radiated from an antenna ✓
耗散与天线辐射功率相同功率的电阻值
D. The resistance in the atmosphere that an antenna must overcome to be able to radiate a signal ✗
天线必须克服大气中的阻力才能发射信号

E9A04. Which of the following factors affect the feed point impedance of an antenna?
以下哪些因素会影响天线的馈电点阻抗?

A. Transmission line length ✗
输电线路长度
B. Antenna height ✓
天线高度
C. The settings of an antenna tuner at the transmitter ✗
发射器上天线调谐器的设置
D. The input power level ✗
输入功率电平

E9A05. What is included in the total resistance of an antenna system?
天线系统的总电阻包括什么?

A. Radiation resistance plus space impedance ✗
辐射电阻加空间阻抗
B. Radiation resistance plus transmission resistance ✗
辐射电阻加传输电阻
C. Transmission-line resistance plus radiation resistance ✗
输电线路电阻加辐射电阻
D. Radiation resistance plus loss resistance ✓
抗辐射加抗损耗

E9A06. What is the effective radiated power relative to a dipole of a repeater station with 200 watts transmitter power output, 4 dB feed line loss, 3.2 dB duplexer loss, 0.8 dB circulator loss, an
发射机功率输出为200瓦、馈线损耗为4 dB、双工器损耗为3.2 dB、循环器损耗为0.8 dB、

A. 317 watts ✓
317瓦
B. 2000 watts ✗
2000瓦
C. 126 watts ✗
126瓦
D. 300 watts ✗
300瓦

E9A07. What is the effective isotropic radiated power of a repeater station with 200 watts transmitter power output, 2 dB feed line loss, 2.8 dB duplexer loss, 1.2 dB circulator loss, and 7 dBi ant
发射机功率输出为200瓦、馈线损耗为2 dB、双工器损耗为2.8 dB、循环器损耗为1.2 dB、天线损耗为7 dBi的中继站的有效各向同性辐射功率是多少

A. 159 watts ✗
159瓦
B. 252 watts ✓
252瓦
C. 632 watts ✗
632瓦
D. 63.2 watts ✗
63.2瓦

E9A08. What is antenna bandwidth?
天线带宽是多少?

A. Antenna length divided by the number of elements ✗
天线长度除以元件数量
B. The frequency range over which an antenna satisfies a performance requirement ✓
天线满足性能要求的频率范围
C. The angle between the half-power radiation points ✗
半功率辐射点之间的角度
D. The angle formed between two imaginary lines drawn through the element ends ✗
穿过元素末端绘制的两条假想线之间形成的角度

E9A09. What is antenna efficiency?
什么是天线效率?

A. Radiation resistance divided by transmission resistance ✗
辐射电阻除以传输电阻
B. Radiation resistance divided by total resistance ✓
辐射电阻除以总电阻
C. Total resistance divided by radiation resistance ✗
总电阻除以辐射电阻
D. Effective radiated power divided by transmitter output ✗
有效辐射功率除以发射机输出

E9A10. Which of the following improves the efficiency of a ground-mounted quarter-wave vertical antenna?
以下哪项可以提高地面安装四分之一波长垂直天线的效率?

A. Installing a radial system ✓
安装径向系统
B. Isolating the coax shield from ground ✗
将同轴电缆屏蔽与接地隔离
C. Shortening the radiating element ✗
缩短辐射元件
D. All these choices are correct ✗
所有这些选择都是正确的

E9A11. Which of the following factors determines ground losses for a ground-mounted vertical antenna operating in the 3 MHz to 30 MHz range?
以下哪个因素决定了在3 MHz至30 MHz范围内工作的地面安装垂直天线的接地损耗?

A. The standing wave ratio ✗
驻波比
B. Distance from the transmitter ✗
与变送器的距离
C. Soil conductivity ✓
土壤电导率
D. Take-off angle ✗
起飞角度

E9A12. How much gain does an antenna have compared to a 1/2-wavelength dipole when it has 6 dB gain over an isotropic antenna?
当天线比各向同性天线有6dB的增益时，与1/2波长的偶极子相比，天线有多少增益?

A. 3.85 dB ✓
3.85分贝
B. 6.0 dB ✗
6.0分贝
C. 8.15 dB ✗
8.15分贝
D. 2.79 dB ✗
2.79分贝

E9A13. What term describes station output, taking into account all gains and losses?
考虑到所有收益和损失，什么术语描述电站输出?

A. Power factor ✗
功率因数
B. Half-power bandwidth ✗
半功率带宽
C. Effective radiated power ✓
有效辐射功率
D. Apparent power ✗
视在功率

E9B Antenna patterns and designs: E and H plane patterns; gain as a function of pattern; antenna modeling
天线图案和设计：E和H平面图案；增益是模式的函数；天线建模

E9B01. In the antenna radiation pattern shown in Figure E9-1, what is the beamwidth?
在图E9-1所示的天线辐射方向图中，波束宽度是多少?

A. 75 degrees ✗
75度
B. 50 degrees ✓
50度
C. 25 degrees ✗
25度
D. 30 degrees ✗
30度

E9B02. In the antenna radiation pattern shown in Figure E9-1, what is the front-to-back ratio?
在图E9-1所示的天线辐射方向图中，前后比是多少?

A. 36 dB ✗
36分贝
B. 18 dB ✓
18分贝
C. 24 dB ✗
24分贝
D. 14 dB ✗
14分贝

E9B03. In the antenna radiation pattern shown in Figure E9-1, what is the front-to-side ratio?
在图E9-1所示的天线辐射方向图中，正面与侧面的比例是多少?

A. 12 dB ✗
12分贝
B. 14 dB ✓
14分贝
C. 18 dB ✗
18分贝
D. 24 dB ✗
24分贝

E9B04. What is the front-to-back ratio of the radiation pattern shown in Figure E9 2?
图E9 2所示辐射图的前后比是多少?

A. 15 dB ✗
15分贝
B. 28 dB ✓
28分贝
C. 3 dB ✗
3分贝
D. 38 dB ✗
38分贝

E9B05. What type of antenna pattern is shown in Figure E9-2?
图E9-2中显示了哪种类型的天线方向图?

A. Elevation ✓
高程
B. Azimuth ✗
方位角
C. Radiation resistance ✗
抗辐射性
D. Polarization ✗
极化

E9B06. What is the elevation angle of peak response in the antenna radiation pattern shown in Figure E9-2?
图E9-2所示天线辐射方向图中峰值响应的仰角是多少?

A. 45 degrees ✗
45度
B. 75 degrees ✗
75度
C. 7.5 degrees ✓
7.5度
D. 25 degrees ✗
25度

E9B07. How does the total amount of radiation emitted by a directional gain antenna compare with the total amount of radiation emitted from a theoretical isotropic antenna, assuming each is driven
假设每个天线都被驱动，定向增益天线发射的辐射总量与理论各向同性天线发射的总辐射量相比如何

A. The total amount of radiation from the directional antenna is increased by the gain of the antenna ✗
定向天线的总辐射量增加了天线的增益
B. The total amount of radiation from the directional antenna is stronger by its front-to-back ratio ✗
定向天线的辐射总量因其前后比而更强
C. They are the same ✓
他们是一样的
D. The radiation from the isotropic antenna is 2.15 dB stronger than that from the directional antenna ✗
各向同性天线的辐射比定向天线的辐射强2.15 dB

E9B08. What is the far field of an antenna?
天线的远场是多少?

A. The region of the ionosphere where radiated power is not refracted ✗
电离层中辐射功率没有折射的区域
B. The region where radiated power dissipates over a specified time period ✗
辐射功率在指定时间段内耗散的区域
C. The region where radiated field strengths are constant ✗
辐射场强恒定的区域
D. The region where the shape of the antenna pattern is independent of distance ✓
天线方向图的形状与距离无关的区域

E9B09. What type of computer program technique is commonly used for modeling antennas?
什么类型的计算机程序技术通常用于天线建模?

A. Graphical analysis ✗
图形分析
B. Method of Moments ✓
矩量法
C. Mutual impedance analysis ✗
互阻抗分析
D. Calculus differentiation with respect to physical properties ✗
关于物理性质的微积分微分

E9B10. What is the principle of a Method of Moments analysis?
矩量分析法的原理是什么?

A. A wire is modeled as a series of segments, each having a uniform value of current ✓
导线被建模为一系列线段，每个线段都具有统一的电流值
B. A wire is modeled as a single sine-wave current generator ✗
将导线建模为单个正弦波电流发生器
C. A wire is modeled as a single sine-wave voltage source ✗
将导线建模为单个正弦波电压源
D. A wire is modeled as a series of segments, each having a distinct value of voltage across it ✗
导线被建模为一系列线段，每个线段上都有不同的电压值

E9B11. What is a disadvantage of decreasing the number of wire segments in an antenna model below 10 segments per half-wavelength?
将天线模型中的线段数量减少到每半波长10个线段以下的缺点是什么?

A. Ground conductivity will not be accurately modeled ✗
接地导电率将无法准确建模
B. The resulting design will favor radiation of harmonic energy ✗
由此产生的设计将有利于谐波能量的辐射
C. The computed feed point impedance may be incorrect ✓
计算的馈电点阻抗可能不正确
D. The antenna will become mechanically unstable ✗
天线将变得机械不稳定

E9C Practical wire antennas; folded dipoles; phased arrays; effects of ground near antennas
实用的有线天线；折叠偶极子；相控阵；天线附近的地面效应

E9C01. What is the radiation pattern of two 1/4-wavelength vertical antennas spaced 1/2-wavelength apart and fed 180 degrees out of phase?
两个1/4波长的垂直天线的辐射方向图是什么，天线间隔1/2波长，馈电180度异相?

A. Cardioid ✗
心形
B. Omni-directional ✗
全方位
C. A figure-8 broadside to the axis of the array ✗
阵列轴线的8字形宽边
D. A figure-8 oriented along the axis of the array ✓
沿阵列轴定向的图形8

E9C02. What is the radiation pattern of two 1/4 wavelength vertical antennas spaced 1/4 wavelength apart and fed 90 degrees out of phase?
两个1/4波长的垂直天线间隔1/4波长，馈电相位相差90度，辐射方向图是什么?

A. Cardioid ✓
心形
B. A figure-8 end-fire along the axis of the array ✗
一个8字形的末端沿着阵列的轴线开火
C. A figure-8 broadside to the axis of the array ✗
阵列轴线的8字形宽边
D. Omni-directional ✗
全方位

E9C03. What is the radiation pattern of two 1/4-wavelength vertical antennas spaced 1/2 wavelength apart and fed in phase?
两个间隔1/2波长并同相馈电的1/4波长垂直天线的辐射方向图是什么?

A. Omni-directional ✗
全方位
B. Cardioid ✗
心形
C. A Figure-8 broadside to the axis of the array ✓
图8阵列轴线的侧面
D. A Figure-8 end-fire along the axis of the array ✗
图8沿阵列轴线的末端火力

E9C04. What happens to the radiation pattern of an unterminated long wire antenna as the wire length is increased?
当导线长度增加时，未端接的长导线天线的辐射方向图会发生什么变化?

A. The lobes become more perpendicular to the wire ✗
叶片变得更加垂直于导线
B. The lobes align more in the direction of the wire ✓
叶片更多地沿导线方向对齐
C. The vertical angle increases ✗
垂直角度增加
D. The front-to-back ratio decreases ✗
前后比例减小

E9C05. Which of the following is a type of OCFD antenna?
以下哪一种是OCFD天线?

A. A dipole fed approximately 1/3 the way from one end with a 4:1 balun to provide multiband operation ✓
一个偶极从一端馈电约1/3，带有4:1巴伦，以提供多频带操作
B. A remotely tunable dipole antenna using orthogonally controlled frequency diversity ✗
一种使用正交控制频率分集的远程可调谐偶极天线
C. A folded dipole center-fed with 300-ohm transmission line ✗
用300欧姆传输线馈电的折叠偶极中心
D. A multiband dipole antenna using one-way circular polarization for frequency diversity ✗
利用单向圆极化实现频率分集的多频带偶极天线

E9C06. What is the effect of adding a terminating resistor to a rhombic antenna?
在菱形天线上添加端接电阻器有什么效果?

A. It reflects the standing waves on the antenna elements back to the transmitter ✗
它将天线元件上的驻波反射回发射器
B. It changes the radiation pattern from bidirectional to unidirectional ✓
它将辐射模式从双向变为单向
C. It changes the radiation pattern from horizontal to vertical polarization ✗
它将辐射方向图从水平偏振变为垂直偏振
D. It decreases the ground loss ✗
它降低了接地损耗

E9C07. What is the approximate feed point impedance at the center of a two-wire folded dipole antenna?
双线折叠偶极天线中心的近似馈电点阻抗是多少?

A. 300 ohms ✓
300欧姆
B. 72 ohms ✗
72欧姆
C. 50 ohms ✗
50欧姆
D. 450 ohms ✗
450欧姆

E9C08. What is a folded dipole antenna?
什么是折叠偶极天线?

A. A dipole one-quarter wavelength long ✗
四分之一波长长的偶极子
B. A type of ground-plane antenna ✗
一种地平面天线
C. A half-wave dipole with an additional parallel wire connecting its two ends ✓
一个半波偶极子，两端连接一根额外的平行线
D. A dipole configured to provide forward gain ✗
配置为提供正向增益的偶极子

E9C09. Which of the following describes a G5RV antenna?
以下哪项描述G5RV天线?

A. A multi-band dipole antenna fed with coax and a balun through a selected length of open wire transmission line ✓
一种多频段偶极天线，通过选定长度的开路传输线，由同轴电缆和巴伦供电
B. A multi-band trap antenna ✗
一种多频段陷波天线
C. A phased array antenna consisting of multiple loops ✗
由多个环路组成的相控阵天线
D. A wide band dipole using shorted coaxial cable for the radiating elements and fed with a◆4:1 balun ✗
一种宽带偶极子，使用短路同轴电缆作为辐射元件，并用◆4:1巴伦

E9C10. Which of the following describes a Zepp antenna?
以下哪项描述了Zepp天线?

A. A dipole constructed from zip cord ✗
由拉链制成的偶极
B. An end-fed dipole antenna ✓
端馈偶极天线
C. An omni-directional antenna commonly used for satellite communications ✗
一种常用于卫星通信的全向天线
D. A vertical array capable of quickly changing the direction of maximum radiation by changing phasing lines ✗
能够通过改变相位线快速改变最大辐射方向的垂直阵列

E9C11. How is the far-field elevation pattern of a vertically polarized antenna affected by being mounted over seawater versus soil?
安装在海水和土壤上的垂直极化天线的远场仰角模式是如何影响的?

A. The low-angle radiation decreases ✗
低角度辐射降低
B. Additional higher vertical angle lobes will appear ✗
将出现其他更高的垂直角瓣
C. Fewer vertical angle lobes will be present ✗
将出现更少的垂直角瓣
D. The low-angle radiation increases ✓
低角度辐射增加

E9C12. Which of the following describes an Extended Double Zepp antenna?
以下哪项描述了扩展双Zepp天线?

A. A wideband vertical antenna constructed from precisely tapered aluminum tubing ✗
一种由精确锥形铝管构成的宽带垂直天线
B. A portable antenna erected using two push support poles ✗
使用两个推式支撑杆架设的便携式天线
C. A center-fed 1.25-wavelength antenna (two 5/8-wave elements in phase) ✓
中心馈电1.25波长天线（两个5/8波同相元件）
D. An end-fed folded dipole antenna ✗
端馈折叠偶极天线

E9C13. How does the radiation pattern of a horizontally polarized 3-element beam antenna vary with increasing height above ground?
水平极化三元波束天线的辐射方向图如何随着离地高度的增加而变化?

A. The takeoff angle of the lowest elevation lobe increases ✗
最低仰角的起飞角增加
B. The takeoff angle of the lowest elevation lobe decreases ✓
最低仰角的起飞角减小
C. The horizontal beamwidth increases ✗
水平波束宽度增加
D. The horizontal beamwidth decreases ✗
水平波束宽度减小

E9C14. How does the performance of a horizontally polarized antenna mounted on the side of a hill compare with the same antenna mounted on flat ground?
安装在山坡上的水平极化天线与安装在平地上的天线相比性能如何?

A. The main lobe takeoff angle increases in the downhill direction ✗
主瓣起飞角在下坡方向上增大
B. The main lobe takeoff angle decreases in the downhill direction ✓
主瓣起飞角沿下坡方向减小
C. The horizontal beamwidth decreases in the downhill direction ✗
水平波束宽度在下坡方向上减小
D. The horizontal beamwidth increases in the uphill direction ✗
水平波束宽度在上坡方向上增加

E9D Yagi antennas; parabolic reflectors; circular polarization; loading coils; top loading; feedpoint impedance of electrically short antennas; antenna Q; RF grounding
八木天线；抛物面反射器；圆极化；加载线圈；顶部荷载；电短路天线的馈电点阻抗；天线Q；射频接地

E9D01. How much does the gain of an ideal parabolic dish antenna change when the operating frequency is doubled?
当工作频率加倍时，理想抛物面天线的增益会改变多少?

A. 2 dB ✗
2分贝
B. 3 dB ✗
3分贝
C. 4 dB ✗
4分贝
D. 6 dB ✓
6分贝

E9D02. How can linearly polarized Yagi antennas be used to produce circular polarization?
如何使用线极化八木天线来产生圆极化?

A. Stack two Yagis fed 90 degrees out of phase to form an array with the respective elements in parallel planes ✗
将两个相位相差90度的亚吉斯堆叠在一起，形成一个阵列，各个元素位于平行平面中
B. Stack two Yagis fed in phase to form an array with the respective elements in parallel planes ✗
将两个同相馈电的亚吉斯堆叠在一起，形成一个阵列，各个元件位于平行平面中
C. Arrange two Yagis perpendicular to each other with the driven elements at the same point on the boom fed 90 degrees out of phase ✓
将两个Yagis相互垂直布置，从动元件位于臂架上的同一点，进给相位相差90度
D. Arrange two Yagis collinear to each other with the driven elements fed 180 degrees out of phase ✗
将两个Yagis排列在同一直线上，驱动元件180度异相馈电

E9D03. Where should a high Q loading coil be placed to minimize losses in a shortened vertical antenna?
在缩短的垂直天线中，应将高Q负载线圈放置在何处，以最大限度地减少损耗?

A. Near the center of the vertical radiator ✓
垂直散热器中心附近
B. As low as possible on the vertical radiator ✗
在垂直散热器上尽可能低
C. As close to the transmitter as possible ✗
尽可能靠近变送器
D. At a voltage node ✗
在电压节点

E9D04. Why should an HF mobile antenna loading coil have a high ratio of reactance to resistance?
为什么高频移动天线负载线圈应该具有高电抗与电阻比?

A. To swamp out harmonics ✗
淹没谐波
B. To lower the radiation angle ✗
降低辐射角
C. To minimize losses ✓
尽量减少损失
D. To minimize the Q ✗
为了最小化Q

E9D05. What usually occurs if a Yagi antenna is designed solely for maximum forward gain?
如果八木天线只为最大前向增益而设计，通常会发生什么?

A. The front-to-back ratio increases ✗
前后比例增加
B. The front-to-back ratio decreases ✓
前后比例减小
C. The frequency response is widened over the whole frequency band ✗
频率响应在整个频带上加宽
D. The SWR is reduced ✗
SWR降低

E9D06. What happens to the SWR bandwidth when one or more loading coils are used to resonate an electrically short antenna?
当一个或多个负载线圈用于使短路天线谐振时，SWR带宽会发生什么变化?

A. It is increased ✗
它增加了
B. It is decreased ✓
它减少了
C. It is unchanged if the loading coil is located at the feed point ✗
如果加载线圈位于馈电点，则保持不变
D. It is unchanged if the loading coil is located at a voltage maximum point ✗
如果负载线圈位于电压最大点，则其保持不变

E9D07. What is an advantage of using top loading in a shortened HF vertical antenna?
在缩短的HF垂直天线中使用顶部负载的优势是什么?

A. Lower Q ✗
下Q
B. Greater structural strength ✗
更大的结构强度
C. Higher losses ✗
更高的损失
D. Improved radiation efficiency ✓
提高辐射效率

E9D08. What happens as the Q of an antenna increases?
当天线的Q值增加时会发生什么?

A. SWR bandwidth increases ✗
SWR带宽增加
B. SWR bandwidth decreases ✓
SWR带宽降低
C. Gain is reduced ✗
增益降低
D. More common-mode current is present on the feed line ✗
馈线上存在更多共模电流

E9D09. What is the function of a loading coil used as part of an HF mobile antenna?
作为HF移动天线的一部分使用的负载线圈的功能是什么?

A. To increase the SWR bandwidth ✗
增加SWR带宽
B. To lower the losses ✗
降低损失
C. To lower the Q ✗
降低Q
D. To cancel capacitive reactance ✓
消除容抗

E9D10. What happens to feed-point impedance at the base of a fixed length HF mobile antenna when operated below its resonant frequency?
当工作频率低于谐振频率时，固定长度HF移动天线底部的馈电点阻抗会发生什么变化?

A. The radiation resistance decreases and the capacitive reactance decreases ✗
辐射电阻降低，容抗降低
B. The radiation resistance decreases and the capacitive reactance increases ✓
辐射电阻降低，容抗增加
C. The radiation resistance increases and the capacitive reactance decreases ✗
辐射电阻增大，容抗减小
D. The radiation resistance increases and the capacitive reactance increases ✗
辐射电阻增加，容抗增加

E9D11. Which of the following conductors would be best for minimizing losses in a station's RF ground system?
以下哪种导线最适合将电站射频接地系统的损耗降至最低?

A. Resistive wire, such as spark plug wire ✗
电阻线，如火花塞线
B. Wide flat copper strap ✓
宽扁铜带
C. Stranded wire ✗
绞线
D. Solid wire ✗
实心导线

E9D12. Which of the following would provide the best RF ground for your station?
以下哪一项将为您的电台提供最佳的射频接地?

A. A 50-ohm resistor connected to ground ✗
接地的50欧姆电阻器
B. An electrically short connection to a metal water pipe ✗
与金属水管的电气短路连接
C. An electrically short connection to 3 or 4 interconnected ground rods driven into the Earth ✓
与3个或4个相互连接的接地棒的电气短路连接
D. An electrically short connection to 3 or 4 interconnected ground rods via a series RF choke ✗
通过串联RF扼流圈与3或4个互连接地棒进行短路连接

E9E Matching: matching antennas to feed lines; phasing lines; power dividers
匹配：将天线与馈线匹配；相位线；功分器

E9E01. What system matches a higher-impedance transmission line to a lower-impedance antenna by connecting the line to the driven element in two places spaced a fraction of a wavelength each side o
什么系统通过将高阻抗传输线连接到驱动元件的两个位置来匹配低阻抗天线，每个位置间隔一个波长的一小部分

A. The gamma matching system ✗
伽马匹配系统
B. The delta matching system ✓
德尔塔匹配系统
C. The omega matching system ✗
omega匹配系统
D. The stub matching system ✗
存根匹配系统

E9E02. What is the name of an antenna matching system that matches an unbalanced feed line to an antenna by feeding the driven element both at the center of the element and at a fraction of a wavel
天线匹配系统的名称是什么？该系统通过在元件的中心和一个波的一小部分馈送被驱动元件来将不平衡馈线匹配到天线

A. The gamma match ✓
gamma匹配
B. The delta match ✗
delta匹配
C. The epsilon match ✗
ε匹配
D. The stub match ✗
存根匹配

E9E03. What is the name of the matching system that uses a section of transmission line connected in parallel with the feed line at or near the feed point?
使用与馈电点或馈电点附近的馈线并联的一段传输线的匹配系统的名称是什么?

A. The gamma match ✗
gamma匹配
B. The delta match ✗
delta匹配
C. The omega match ✗
欧米茄火柴
D. The stub match ✓
存根匹配

E9E04. What is the purpose of the series capacitor in a gamma-type antenna matching network?
伽马型天线匹配网络中串联电容器的用途是什么?

A. To provide DC isolation between the feed line and the antenna ✗
在馈线和天线之间提供直流隔离
B. To cancel the inductive reactance of the matching network ✓
抵消匹配网络的电抗
C. To provide a rejection notch that prevents the radiation of harmonics ✗
提供抑制谐波辐射的抑制陷波
D. To transform the antenna impedance to a higher value ✗
将天线阻抗转换为更高的值

E9E05. How must an antenna's driven element be tuned to use a hairpin matching system?
天线的驱动元件必须如何调谐才能使用发夹匹配系统?

A. The driven element reactance must be capacitive ✓
被驱动元件电抗必须是电容性的
B. The driven element reactance must be inductive ✗
被驱动元件电抗必须是电感性的
C. The driven element resonance must be lower than the operating frequency ✗
从动元件谐振必须低于工作频率
D. The driven element radiation resistance must be higher than the characteristic impedance of the transmission line ✗
被驱动元件的辐射电阻必须高于传输线的特性阻抗

E9E06. Which of these feed line impedances would be suitable for constructing a quarter-wave Q-section for matching a 100-ohm loop to 50-ohm feed line?
这些馈线阻抗中的哪一个将适合于构建用于匹配100欧姆环路到50欧姆馈线的四分之一波Q段?

A. 50 ohms ✗
50欧姆
B. 62 ohms ✗
62欧姆
C. 75 ohms ✓
75欧姆
D. 450 ohms ✗
450欧姆

E9E07. What parameter describes the interactions at the load end of a mismatched transmission line?
什么参数描述了不匹配输电线路负载端的相互作用?

A. Characteristic impedance ✗
特性阻抗
B. Reflection coefficient ✓
反射系数
C. Velocity factor ✗
速度系数
D. Dielectric constant ✗
介电常数

E9E08. What is a use for a Wilkinson divider?
威尔金森分配器有什么用?

A. It divides the operating frequency of a transmitter signal so it can be used on a lower frequency band ✗
它划分发射机信号的工作频率，以便可以在较低的频带上使用
B. It is used to feed high-impedance antennas from a low-impedance source ✗
它用于从低阻抗源向高阻抗天线馈电
C. It is used to divide power equally between two 50-ohm loads while maintaining 50-ohm input impedance ✓
它用于在两个50欧姆负载之间平均分配功率，同时保持50欧姆的输入阻抗
D. It is used to feed low-impedance loads from a high-impedance source ✗
它用于从高阻抗源向低阻抗负载馈电

E9E09. Which of the following is used to shunt-feed a grounded tower at its base?
以下哪一项用于在接地塔的底部分流馈电?

A. Double-bazooka match ✗
双火箭筒火柴
B. Hairpin match ✗
发夹火柴
C. Gamma match ✓
Gamma匹配
D. All these choices are correct ✗
所有这些选择都是正确的

E9E10. Which of these choices is an effective way to match an antenna with a 100-ohm feed point impedance to a 50-ohm coaxial cable feed line?
以下哪种选择是将具有100欧姆馈电点阻抗的天线与50欧姆同轴电缆馈线匹配的有效方法?

A. Connect a 1/4-wavelength open stub of 300-ohm twinlead in parallel with the coaxial feed line where it connects to the antenna ✗
将300欧姆双引线的1/4波长开路短截线与连接天线的同轴馈线并联
B. Insert a 1/2 wavelength piece of 300-ohm twinlead in series between the antenna terminals and the 50-ohm feed cable ✗
在天线端子和50欧姆馈电电缆之间插入一根1/2波长的300欧姆双导线
C. Insert a 1/4-wavelength piece of 75-ohm coaxial cable transmission line in series between the antenna terminals and the 50-ohm feed cable ✓
在天线端子和50欧姆馈电电缆之间插入一根1/4波长的75欧姆同轴电缆传输线
D. Connect a 1/2 wavelength shorted stub of 75-ohm cable in parallel with the 50-ohm cable where it attaches to the antenna ✗
将75欧姆电缆的1/2波长短路短截线与连接到天线的50欧姆电缆并联连接

E9E11. What is the primary purpose of phasing lines when used with an antenna having multiple driven elements?
当与具有多个驱动元件的天线一起使用时，相位线的主要用途是什么?

A. It ensures that each driven element operates in concert with the others to create the desired antenna pattern ✓
它确保每个被驱动元件与其他元件协同工作，以创建所需的天线方向图
B. It prevents reflected power from traveling back down the feed line and causing harmonic radiation from the transmitter ✗
它可以防止反射功率沿馈线返回并引起发射器的谐波辐射
C. It allows single-band antennas to operate on other bands ✗
它允许单波段天线在其他波段工作
D. It creates a low-angle radiation pattern ✗
它创造了一个低角度的辐射模式

E9F Transmission lines: characteristics of open and shorted feed lines; coax versus open-wire; velocity factor; electrical length; coaxial cable dielectrics
输电线路：馈线开路和短路的特性；同轴电缆与开路电缆；速度因子；电气长度；同轴电缆电介质

E9F01. What is the velocity factor of a transmission line?
输电线路的速度系数是多少?

A. The ratio of the characteristic impedance of the line to the terminating impedance ✗
线路的特性阻抗与端接阻抗之比
B. The index of shielding for coaxial cable ✗
同轴电缆屏蔽指数
C. The velocity of the wave in the transmission line multiplied by the velocity of light in a vacuum ✗
波在传输线上的速度乘以真空中的光速
D. The velocity of the wave in the transmission line divided by the velocity of light in a vacuum ✓
波在传输线上的速度除以真空中的光速

E9F02. Which of the following has the biggest effect on the velocity factor of a transmission line?
以下哪项对输电线路的速度因子影响最大?

A. The termination impedance ✗
终端阻抗
B. The line length ✗
线路长度
C. Dielectric materials used in the line ✓
线路中使用的介电材料
D. The center conductor resistivity ✗
中心导体电阻率

E9F03. Why is the physical length of a coaxial cable transmission line shorter than its electrical length?
为什么同轴电缆传输线的物理长度比其电气长度短?

A. Skin effect is less pronounced in the coaxial cable ✗
趋肤效应在同轴电缆中不太明显
B. The characteristic impedance is higher in a parallel feed line ✗
并联馈线的特性阻抗较高
C. The surge impedance is higher in a parallel feed line ✗
并联馈线中的浪涌阻抗较高
D. Electrical signals move more slowly in a coaxial cable than in air ✓
电信号在同轴电缆中的移动速度比在空气中慢

E9F04. What impedance does a 1/2-wavelength transmission line present to a generator when the line is shorted at the far end?
当1/2波长传输线在远端短路时，它对发电机的阻抗是多少?

A. Very high impedance ✗
非常高的阻抗
B. Very low impedance ✓
极低阻抗
C. The same as the characteristic impedance of the line ✗
与线路的特性阻抗相同
D. The same as the output impedance of the generator ✗
与发电机的输出阻抗相同

E9F05. What is the approximate physical length of a solid polyethylene dielectric coaxial transmission line that is electrically 1/4 wavelength long at 14.1 MHz?
在14.1MHz下电气长度为1/4波长的固体聚乙烯电介质同轴传输线的近似物理长度是多少?

A. 10.6 meters ✗
10.6米
B. 5.3 meters ✗
5.3米
C. 4.3 meters ✗
4.3米
D. 3.5 meters ✓
3.5米

E9F06. What is the approximate physical length of an air-insulated, parallel conductor transmission line that is electrically 1/2 wavelength long at 14.10 MHz?
在14.10 MHz下，电气长度为1/2波长的空气绝缘平行导体传输线的近似物理长度是多少?

A. 7.0 meters ✗
7.0米
B. 8.5 meters ✗
8.5米
C. 10.6 meters ✓
10.6米
D. 13.3 meters ✗
13.3米

E9F07. How does ladder line compare to small-diameter coaxial cable such as RG-58 at 50 MHz?
阶梯线与50 MHz下的RG-58等小直径同轴电缆相比如何?

A. Lower loss ✓
降低损失
B. Higher SWR ✗
SWR更高
C. Smaller reflection coefficient ✗
反射系数较小
D. Lower velocity factor ✗
低速系数

E9F08. Which of the following is a significant difference between foam dielectric coaxial cable and solid dielectric cable, assuming all other parameters are the same?
假设所有其他参数相同，以下哪项是泡沫电介质同轴电缆和固体电介质电缆之间的显著差异?

A. Foam dielectric has lower safe operating voltage limits ✗
泡沫电介质具有较低的安全工作电压限制
B. Foam dielectric has lower loss per unit of length ✗
泡沫电介质的单位长度损耗较低
C. Foam dielectric has higher velocity factor ✗
泡沫电介质具有较高的速度因子
D. All these choices are correct ✓
所有这些选择都是正确的

E9F09. What is the approximate physical length of a foam polyethylene dielectric coaxial transmission line that is electrically 1/4 wavelength long at 7.2 MHz?
在7.2MHz下电1/4波长长的泡沫聚乙烯电介质同轴传输线的近似物理长度是多少?

A. 10.4 meters ✗
10.4米
B. 8.3 meters ✓
8.3米
C. 6.9 meters ✗
6.9米
D. 5.2 meters ✗
5.2米

E9F10. What impedance does a 1/8-wavelength transmission line present to a generator when the line is shorted at the far end?
当线路在远端短路时，1/8波长传输线对发电机的阻抗是多少?

A. A capacitive reactance ✗
电容电抗
B. The same as the characteristic impedance of the line ✗
与线路的特性阻抗相同
C. An inductive reactance ✓
电感电抗
D. Zero ✗
零

E9F11. What impedance does a 1/8-wavelength transmission line present to a generator when the line is open at the far end?
当线路远端开路时，1/8波长传输线对发电机的阻抗是多少?

A. The same as the characteristic impedance of the line ✗
与线路的特性阻抗相同
B. An inductive reactance ✗
电感电抗
C. A capacitive reactance ✓
电容电抗
D. Infinite ✗
极大的

E9F12. What impedance does a 1/4-wavelength transmission line present to a generator when the line is open at the far end?
当线路远端开路时，1/4波长传输线对发电机的阻抗是多少?

A. The same as the characteristic impedance of the line ✗
与线路的特性阻抗相同
B. The same as the input impedance to the generator ✗
与发电机的输入阻抗相同
C. Very high impedance ✗
非常高的阻抗
D. Very low impedance ✓
极低阻抗

E9F13. What impedance does a 1/4-wavelength transmission line present to a generator when the line is shorted at the far end?
当1/4波长传输线在远端短路时，它对发电机的阻抗是多少?

A. Very high impedance ✓
非常高的阻抗
B. Very low impedance ✗
极低阻抗
C. The same as the characteristic impedance of the transmission line ✗
与传输线的特性阻抗相同
D. The same as the generator output impedance ✗
与发电机输出阻抗相同

E9G The Smith chart
史密斯圆图

E9G01. Which of the following can be calculated using a Smith chart?
以下哪项可以使用史密斯圆图进行计算?

A. Impedance along transmission lines ✓
沿传输线的阻抗
B. Radiation resistance ✗
抗辐射性
C. Antenna radiation pattern ✗
天线辐射方向图
D. Radio propagation ✗
无线电传播

E9G02. What type of coordinate system is used in a Smith chart?
史密斯圆图使用哪种类型的坐标系?

A. Voltage circles and current arcs ✗
电压圆和电流弧
B. Resistance circles and reactance arcs ✓
电阻圆和电抗弧
C. Voltage lines and current chords ✗
电压线和电流弦
D. Resistance lines and reactance chords ✗
电阻线和电抗弦

E9G03. Which of the following is often determined using a Smith chart?
以下哪一项经常使用史密斯圆图来确定?

A. Beam headings and radiation patterns ✗
波束指向和辐射方向图
B. Satellite azimuth and elevation bearings ✗
卫星方位角和仰角
C. Impedance and SWR values in transmission lines ✓
输电线路中的阻抗和SWR值
D. Trigonometric functions ✗
三角函数

E9G04. What are the two families of circles and arcs that make up a Smith chart?
构成史密斯圆图的圆和弧的两个族是什么?

A. Resistance and voltage ✗
电阻和电压
B. Reactance and voltage ✗
电抗和电压
C. Resistance and reactance ✓
电阻和电抗
D. Voltage and impedance ✗
电压和阻抗

E9G05. Which of the following is a common use for a Smith chart?
以下哪项是史密斯圆图的常用项?

A. Determine the length and position of an impedance matching stub ✓
确定阻抗匹配短截线的长度和位置
B. Determine the impedance of a transmission line, given the physical dimensions ✗
在给定物理尺寸的情况下，确定传输线的阻抗
C. Determine the gain of an antenna given the physical and electrical parameters ✗
在给定物理和电气参数的情况下确定天线的增益
D. Determine the loss/100 feet of a transmission line, given the velocity factor and conductor materials ✗
在给定速度因子和导体材料的情况下，确定输电线路的损耗/100英尺

E9G06. On the Smith chart shown in Figure E9-3, what is the name for the large outer circle on which the reactance arcs terminate?
在图E9-3所示的史密斯圆图上，电抗弧终止的大外圆的名称是什么?

A. Prime axis ✗
素轴
B. Reactance axis ✓
电抗轴
C. Impedance axis ✗
阻抗轴
D. Polar axis ✗
极轴

E9G07. On the Smith chart shown in Figure E9-3, what is the only straight line shown?
在图E9-3所示的史密斯圆图上，显示的唯一直线是什么?

A. The reactance axis ✗
电抗轴
B. The current axis ✗
当前轴
C. The voltage axis ✗
电压轴
D. The resistance axis ✓
阻力轴

E9G08. What is the process of normalization with regard to a Smith chart?
史密斯圆图的归一化过程是什么?

A. Reassigning resistance values with regard to the reactance axis ✗
重新分配与电抗轴有关的电阻值
B. Reassigning reactance values with regard to the resistance axis ✗
重新分配与电阻轴有关的电抗值
C. Reassigning impedance values with regard to the prime center ✓
重新指定关于主中心的阻抗值
D. Reassigning prime center with regard to the reactance axis ✗
重新指定相对于电抗轴的初心

E9G09. What third family of circles is often added to a Smith chart during the process of solving problems?
在解决问题的过程中，史密斯圆图中经常添加哪些第三族圆?

A. Standing wave ratio circles ✓
驻波比圆
B. Antenna-length circles ✗
天线长度圆
C. Coaxial-length circles ✗
同轴长度圆
D. Radiation-pattern circles ✗
辐射图案圆

E9G10. What do the arcs on a Smith chart represent?
史密斯圆图上的弧代表什么?

A. Frequency ✗
频率
B. SWR ✗
C. Points with constant resistance ✗
具有恒定电阻的点
D. Points with constant reactance ✓
具有恒定电抗的点

E9G11. How are the wavelength scales on a Smith chart calibrated?
史密斯圆图上的波长刻度是如何校准的?

A. In fractions of transmission line electrical frequency ✗
在传输线电气频率的分数中
B. In fractions of transmission line electrical wavelength ✓
在传输线电波长的分数中
C. In fractions of antenna electrical wavelength ✗
天线电波长的分数
D. In fractions of antenna electrical frequency ✗
天线电气频率的分数

E9H Receiving Antennas: radio direction finding antennas; Beverage antennas; specialized receiving antennas; long-wire receiving antennas
接收天线：无线电测向天线；饮料天线；专用接收天线；长线接收天线

E9H01. When constructing a Beverage antenna, which of the following factors should be included in the design to achieve good performance at the desired frequency?
在构建饮料天线时，设计中应包括以下哪些因素，以在所需频率下实现良好性能?

A. Its overall length must not exceed 1/4 wavelength ✗
其总长度不得超过1/4波长
B. It must be mounted more than 1 wavelength above ground ✗
它必须安装在离地1个波长以上
C. It should be configured as a four-sided loop ✗
应将其配置为四边环
D. It should be one or more wavelengths long ✓
它应该是一个或多个波长长

E9H02. Which is generally true for low band (160 meter and 80 meter) receiving antennas?
低频段（160米和80米）接收天线通常是这样的?

A. Atmospheric noise is so high that gain over a dipole is not important ✓
大气噪声如此之高，以至于偶极上的增益并不重要
B. They must be erected at least 1/2 wavelength above the ground to attain good directivity ✗
它们必须架设在离地至少1/2波长的地方，以获得良好的指向性
C. Low loss coax transmission line is essential for good performance ✗
低损耗同轴传输线对良好性能至关重要
D. All these choices are correct ✗
所有这些选择都是正确的

E9H03. What is Receiving Directivity Factor (RDF)?
什么是接收方向性因子（RDF）？

A. Forward gain compared to the gain in the reverse direction ✗
正向增益与反向增益的比较
B. Relative directivity compared to isotropic ✗
与各向同性相比的相对方向性
C. Relative directivity compared to a dipole ✗
与偶极子相比的相对方向性
D. Forward gain compared to average gain over the entire hemisphere ✓
与整个半球的平均增益相比的正向增益

E9H04. What is an advantage of placing a grounded electrostatic shield around a small loop direction-finding antenna?
在小型环形测向天线周围放置接地静电屏蔽的优点是什么?

A. It adds capacitive loading, increasing the bandwidth of the antenna ✗
它增加了电容负载，增加了天线的带宽
B. It eliminates unbalanced capacitive coupling to the surroundings, improving the nulls ✓
它消除了与周围环境的不平衡电容耦合，改善了零点
C. It eliminates tracking errors caused by strong out-of-band signals ✗
它消除了由强带外信号引起的跟踪误差
D. It increases signal strength by providing a better match to the feed line ✗
它通过提供与馈线更好的匹配来提高信号强度

E9H05. What is the main drawback of a small wire-loop antenna for direction finding?
用于测向的小型有线环形天线的主要缺点是什么?

A. It has a bidirectional pattern ✓
它具有双向模式
B. It has no clearly defined null ✗
它没有明确定义的null
C. It is practical for use only on VHF and higher bands ✗
它只适用于VHF和更高波段
D. All these choices are correct ✗
所有这些选择都是正确的

E9H06. What is the triangulation method of direction finding?
什么是三角测量测向方法?

A. The geometric angles of sky waves from the source are used to determine its position ✗
天波源的几何角度用于确定其位置
B. A fixed receiving station plots three headings to the signal source ✗
固定接收站绘制到信号源的三个航向
C. Antenna headings from several different receiving locations are used to locate the signal source ✓
来自多个不同接收位置的天线航向用于定位信号源
D. A fixed receiving station uses three different antennas to plot the location of the signal source ✗
固定接收站使用三个不同的天线来绘制信号源的位置

E9H07. Why is RF attenuation used when direction-finding?
测向时为什么要使用射频衰减?

A. To narrow the receiver bandwidth ✗
缩小接收器带宽
B. To compensate for isotropic directivity and the antenna effect of feed lines ✗
补偿各向同性方向性和馈线的天线效应
C. To increase receiver sensitivity ✗
提高接收器灵敏度
D. To prevent receiver overload which reduces pattern nulls ✓
防止接收器过载，从而减少模式空值

E9H08. What is the function of a sense antenna?
感应天线的功能是什么?

A. It modifies the pattern of a DF antenna array to provide a null in one direction ✓
它修改测向天线阵列的方向图，以在一个方向上提供零位
B. It increases the sensitivity of a DF antenna array ✗
它提高了测向天线阵列的灵敏度
C. It allows DF antennas to receive signals at different vertical angles ✗
它允许测向天线接收不同垂直角度的信号
D. It provides diversity reception that cancels multipath signals ✗
它提供分集接收，可消除多径信号

E9H09. What is a Pennant antenna?
什么是Pennant天线?

A. A four-element, high-gain vertical array invented by George Pennant ✗
George Pennant发明的四元高增益垂直阵列
B. A small, vertically oriented receiving antenna consisting of a triangular loop terminated in approximately 900 ohms ✓
一种小型垂直定向接收天线，由端接在约900欧姆的三角形环路组成
C. A form of rhombic antenna terminated in a variable capacitor to provide frequency diversity ✗
一种菱形天线，端接在可变电容器中以提供频率分集
D. A stealth antenna built to look like a flagpole ✗
一种看起来像旗杆的隐形天线

E9H10. How can the output voltage of a multiple-turn receiving loop antenna be increased?
如何提高多匝接收环形天线的输出电压?

A. By reducing the permeability of the loop shield ✗
通过降低环路屏蔽的磁导率
B. By utilizing high impedance wire for the coupling loop ✗
通过将高阻抗导线用于耦合回路
C. By winding adjacent turns in opposing directions ✗
通过沿相反方向缠绕相邻匝
D. By increasing the number of turns and/or the area ✓
通过增加匝数和/或面积

E9H11. What feature of a cardioid pattern antenna makes it useful for direction finding?
心形天线的什么特性使其对测向有用?

A. A very sharp peak ✗
一座非常陡峭的山峰
B. A very sharp single null ✓
一个非常尖锐的单零
C. Broadband response ✗
宽带响应
D. High radiation angle ✗
高辐射角

E0A Safety: RF radiation hazards; hazardous materials; grounding
安全：射频辐射危害；危险品；接地

E0A01. What is the primary function of an external earth connection or ground rod?
外部接地连接或接地棒的主要功能是什么?

A. Reduce received noise ✗
减少接收噪声
B. Lightning protection ✓
防雷
C. Reduce RF current flow between pieces of equipment ✗
减少设备之间的射频电流
D. Reduce RFI to telephones and home entertainment systems ✗
减少对电话和家庭娱乐系统的RFI

E0A02. When evaluating RF exposure levels from your station at a neighbor's home, what must you do?
当在邻居家评估你的电台的射频暴露水平时，你必须怎么做?

A. Ensure signals from your station are less than the controlled Maximum Permitted Exposure (MPE) limits ✗
确保来自您电台的信号小于受控的最大允许暴露（MPE）限制
B. Ensure signals from your station are less than the uncontrolled Maximum Permitted Exposure (MPE) limits ✓
确保来自您电台的信号小于不受控制的最大允许暴露（MPE）限制
C. Ensure signals from your station are less than the controlled Maximum Permitted Emission (MPE) limits ✗
确保来自台站的信号低于受控的最大允许排放（MPE）限制
D. Ensure signals from your station are less than the uncontrolled Maximum Permitted Emission (MPE) limits ✗
确保来自站点的信号小于不受控制的最大允许排放（MPE）限制

E0A03. Over what range of frequencies are the FCC human body RF exposure limits most restrictive?
FCC人体射频暴露限制在什么频率范围内最严格?

A. 300 kHz to 3 MHz ✗
300 kHz至3 MHz
B. 3 to 30 MHz ✗
3至30 MHz
C. 30 to 300 MHz ✓
30至300 MHz
D. 300 to 3000 MHz ✗
300至3000 MHz

E0A04. When evaluating a site with multiple transmitters operating at the same time, the operators and licensees of which transmitters are responsible for mitigating over-exposure situations?
在评估多个变送器同时运行的现场时，哪些变送器的操作员和许可证持有者负责缓解过度暴露的情况?

A. Only the most powerful transmitter ✗
只有最强大的发射器
B. Only commercial transmitters ✗
仅限商用变送器
C. Each transmitter that produces 5 percent or more of its MPE limit in areas where the total MPE limit is exceeded. ✓
在超过总MPE限制的区域内产生其MPE限制5%或更多的每个发射器。
D. Each transmitter operating with a duty cycle greater than 50 percent ✗
工作循环大于50%的每个变送器

E0A05. What is one of the potential hazards of operating in the amateur radio microwave bands?
在业余无线电微波波段工作的潜在危险之一是什么?

A. Microwaves are ionizing radiation ✗
微波是电离辐射
B. The high gain antennas commonly used can result in high exposure levels ✓
通常使用的高增益天线会导致高曝光水平
C. Microwaves often travel long distances by ionospheric reflection ✗
微波经常通过电离层反射传播很远的距离
D. The extremely high frequency energy can damage the joints of antenna structures ✗
极高的频率能量会损坏天线结构的接头

E0A06. Why are there separate electric (E) and magnetic (H) field MPE limits?
为什么有单独的电场（E）和磁场（H）MPE限制?

A. The body reacts to electromagnetic radiation from both the E and H fields ✗
身体对来自E场和H场的电磁辐射作出反应
B. Ground reflections and scattering make the field strength vary with location ✗
地面反射和散射使场强随位置而变化
C. E field and H field radiation intensity peaks can occur at different locations ✗
E场和H场辐射强度峰值可能出现在不同的位置
D. All these choices are correct ✓
所有这些选择都是正确的

E0A07. How may dangerous levels of carbon monoxide from an emergency generator be detected?
如何检测来自应急发电机的一氧化碳的危险水平?

A. By the odor ✗
气味
B. Only with a carbon monoxide detector ✓
仅带一氧化碳探测器
C. Any ordinary smoke detector can be used ✗
可以使用任何普通的烟雾探测器
D. By the yellowish appearance of the gas ✗
由于气体呈黄色

E0A08. What does SAR measure?
SAR测量的是什么?

A. Synthetic Aperture Ratio of the human body ✗
人体合成孔径比
B. Signal Amplification Rating ✗
信号放大额定值
C. The rate at which RF energy is absorbed by the body ✓
身体吸收射频能量的速率
D. The rate of RF energy reflected from stationary terrain ✗
静止地形反射的射频能量的速率

E0A09. Which insulating material commonly used as a thermal conductor for some types of electronic devices is extremely toxic if broken or crushed and the particles are accidentally inhaled?
哪种绝缘材料通常用作某些类型电子设备的热导体，如果破裂或压碎，颗粒被意外吸入，则具有极高的毒性?

A. Mica ✗
云母
B. Zinc oxide ✗
氧化锌
C. Beryllium Oxide ✓
氧化铍
D. Uranium Hexafluoride ✗
六氟化铀

E0A10. What toxic material may be present in some electronic components such as high voltage capacitors and transformers?
高压电容器和变压器等电子元件中可能存在哪些有毒物质?

A. Polychlorinated biphenyls ✓
多氯联苯
B. Polyethylene ✗
聚乙烯
C. Polytetrafluoroethylene ✗
聚四氟乙烯
D. Polymorphic silicon ✗
多晶硅

E0A11. Which of the following injuries can result from using high-power UHF or microwave transmitters?
使用高功率UHF或微波发射器可能导致以下哪种伤害?

A. Hearing loss caused by high voltage corona discharge ✗
高压电晕放电引起的听力损失
B. Blood clotting from the intense magnetic field ✗
强磁场使血液凝结
C. Localized heating of the body from RF exposure in excess of the MPE limits ✓
射频暴露导致身体局部发热超过MPE限值
D. Ingestion of ozone gas from the cooling system ✗
从冷却系统摄入臭氧气体