SLIATE

Jumail-0039

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION
(Established in the Ministry of Higher Education vide in Act No 29 of 1995

Higher National Diploma in Information Technology

Second Year, First Semester Examination – 2022

HNDIT3042- Database Management System

Instructions to Candidates:	**Time: Three Hours (03)**
Answer five (05) questions only.	No. of Pages :02
All Questions carry equal marks	No of Question :06

Q1

i). What is meant by a Database Management System? (04 Marks)
ii). Draw a diagram to demonstrate the three-Schema Architecture (04 Marks)
iii). Explain what is logical data independence and physical data independence. (06 Marks)
iv). Briefly explain the duties of the Database administrator. (06 Marks)

Q2

i). Name different four types of database models used in creating a database. (04 Marks)
ii). Briefly explain the following terms used in Relational Data Model
    a. Domain of the attribute
    b. Degree of the relation (04 Marks)
iii). Briefly explain the Primary keys and Candidate keys used in Relational
    Databases. (06 Marks)
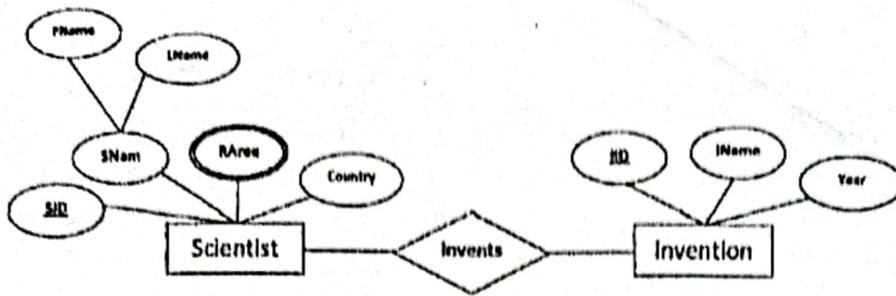iv). Describe referential integrity in the relational database model. (06 Marks)

(20 Marks)

Q3

i). Draw ER diagram for the scenario given below
ABC university maintains semester time table to manage its lab sessions,
lectures and assignments. Lectures, lab sessions and assignments are
assigned to one or more two hours' time period from 8.30 to 5.00pm. Time
period 12.30pm to 1.00pm is assigned to lunch break. Lecturers are assigned
one or more lectures. Demonstrators are assigned to one or more lab sessions
and assignments. (08 Marks)

ii). Draw EER (Enhanced Entity Relationship) Diagram for the case given
below.

Halls belong to a particular building. There are two types of halls, lecture
halls and seminar halls (04 Marks)

iii). Convert the ER diagrams to the relational model given below. There is many
to many relation is available between scientist and invention. (08 Marks)

Q4

i). Define what is the first normal form. (04 Marks)

ii). Explain what is transitive dependency and partial dependency. (04 Marks)

Examine the relation shown below and convert it to 1NF, 2NF and 3NF.

ProjectNo	Project name	Supervisor	Emp No	Emp Name	DeptNo	DeptNamo	HourlyRate
C001	Content Management System	Mr. . A.K.Silva	E001	Mr.Amal Fernando	DA1	HR	1500
C002	POS	Mr. Mohomad	E002	Mr.AK. Silva	DA2	Accounting	5000
C003	Laravel	Mr.Asitha	E003	Mr. Kasun	DA1	HR	2000

(12 Marks)

(20 Marks)

Q5

Examine the following relation, **Book** and write a SQL statement for the questions given below.

ISBN	Title	Publisher	Author	Country
ISBN2B6	Madol Duwa	ABC Publisher	Martin Wickramasinhge	SriLanka
ISBN4B9	Head First	AKC Poublisher	Cathey Sierra	USA

i). To create a Book table (The primary key is underlined) (05 Marks)

ii). To insert the first record into Book. (03 Marks)

iii). To add a new column as price to Book tabl (03 Marks)

iv). To change the first record with "ABC Publisher" as "XYZ Publisher" (03 Marks)

v). To find the book titles written by authors from Sri Lanka (03 Marks)

iv). To find the all details of book written by Martin Wickramasinhge under ABC Publisher (03 Marks)

(20 Marks)

Q6

i). State the difference between authentication and authorization. (04 Marks)

ii). Explain what is Discretionary Access Control (DAC). (04 Marks)

iii). Explain the following countermeasure used to protect the database.

a). View

b). Backup (06 Marks)

iv). Database security is important. Do you agree? Explain your view. (06 Marks)

(20 Marks)