CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – I Session- July – Dec, 2023 Month-October

Sem- CSE 5th(AI)/DS

Subject- Pattern Recognition and Machine Learning Code- C128571(02)

Note: -Question 1 is each part is compulsory. Attempt any two questions from A and B.

Part A

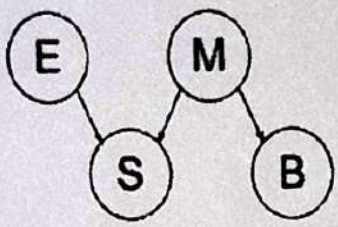
Q. 1: What do you mean by learning? Explain well defined problems in brief. 4 Marks

Q. 2: State Bayes theorem? Consider a scenario, where a smell of Sulphur (S) can be caused either by rotten eggs (E) or as a sign of the doom brought by the Mayan Apocalypse (M). The Mayan Apocalypse also causes the oceans to boil (B). The Bayesian network and corresponding conditional probability tables for this situation are shown below 8 Marks

P(E)	
+e	0.4
−e	0.6

P(M)	
+m	0.1
−m	0.9

P(S|E,M)			
+e	+m	+s	1.0
+e	+m	−s	0.0
+e	−m	+s	0.8
+e	−m	−s	0.2
−e	+m	+s	0.3
−e	+m	−s	0.7
−e	−m	+s	0.1
−e	−m	−s	0.9



P(B|M)		
+m	+b	1.0
+m	−b	0.0
−m	+b	0.1
−m	−b	0.9

Then find-

(i) What is the probability that the oceans boil?

(ii) What is the probability that the Mayan Apocalypse is occurring, given that there is a smell of Sulphur, the oceans are boiling, and there are rotten eggs?

(iii) What is the probability that the Mayan Apocalypse is occurring, given that the oceans are boiling?

Q 3: After your yearly checkup, the doctor has bad news and good news. The bad news is that you tested positive for a serious disease, and that the test is 99% accurate (i.e., the probability of testing positive given that you have the disease is 0.99, as it is the probability of testing negative given that you do not have the disease). The good news is that this is a rare disease, striking only one in 10,000 people. Why is it good news that the disease is rare? What are the chances that you actually have the disease? 8 Marks

Q 4: Explain Perceptron model in Artificial Neural Network. Implement Ex-OR gate using multi-layer perceptron model. Consider initial weights are 1, threshold is 1 and learning rate is 1.5. 8 Marks

Part B

Q. What do you mean by kernel? Explain Semi definite positive kernel. 4 Marks

Q. 2: Explain fisher discriminants function? Why it is preferred from other discriminants function. 8 Marks

Q. 3: What is hyper plane and Margin in SVM? Derive an expression for maximum marginal hyper plane. 8 Marks

Q. 4: What is Markov decision property? Explain Generative model? 8 Marks

Chhattisgarh Swami Vivekanand Technical University

University Teaching Department

Re-Class Test (*July-December 2023*)

B.Tech(H)-5th Semester

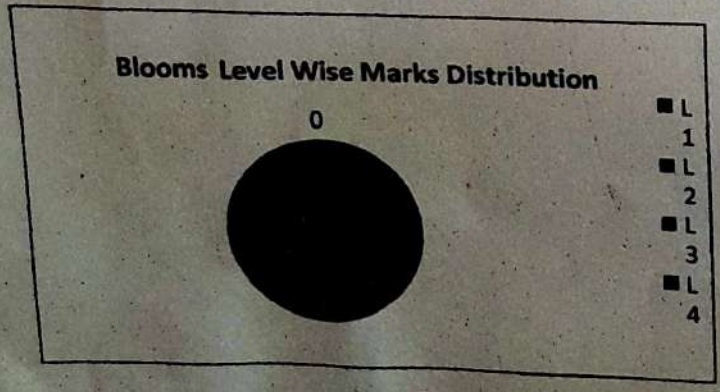
Branch: DS

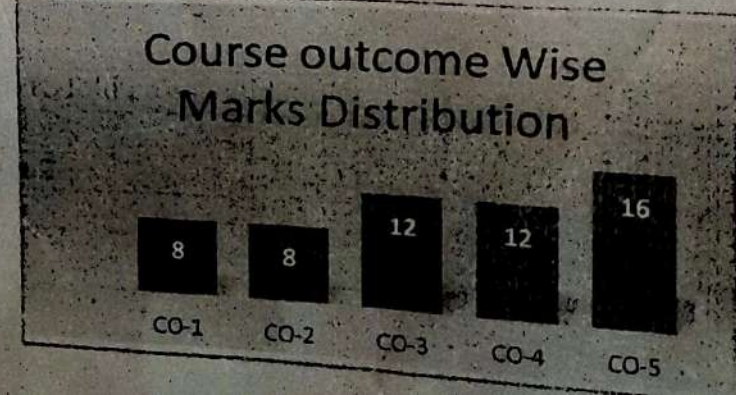
Subject Name: Intelligent Data Analysis **Subject Code: C128572(022)**

Max Marks: 40 **Min Marks:14** **Times: 2 hrs**

Note: Part A(MCQ) is compulsory, attempt any two questions from B, C, and D.

Q.No.		Questions	Marks	BL	CO
		Part 1			
1	a	**What is the main difference between K-means and K-medoids clustering algorithms?** E. K-means uses centroids, while K-medoids use medoids F. K-means is a hierarchical clustering algorithm, while K-medoids is a partitional clustering algorithm G. K-means is sensitive to outliers, while K-medoids is robust to outliers H. K-means can handle categorical data, while K-medoids cannot	4	L3	3
	b	Explain sampling with example.	8	L1	1
	c	Explain the need of Model Evaluation. Explain K-fold cross validation	8	L2	2
	d	Explain Hunt's algorithm. Present an example	8	L3	3
		Part 2			
3	a	**How do you calculate Confidence (A -> B)?** (e) Support(A ∩ B) / Support (A) (f) Support(A ∩ B) / Support (B) (g) Support(A U B) / Support (A) (h) Support(A U B) / Support (B)	4	L3	4
	b	Explain Apriori algorithm for frequent Item set generation.	8	L3	
	c	Explain Cluster-based approach of anomaly detection	8	L4	
	d	Elaborate vast area of applications of anomaly detection.	8	L5	





Chhattisgarh Swami Vivekanad Technical University Bhilai

University Teaching Department

BTech Honors – V Semester (RE-CT)

Branch – Data Science & Artificial Intelligence

Subject: CRYPTOGRAPHY AND NETWORK SECURITY

Date: Time: 22/12/2023 **Time: 11:00 am - 1:00 pm** **Max Marks: 40**

Note: Question 1 in each unit is compulsory and carries 4 marks. Attempt any two from question 2,3, and 4 which carries 8 marks each.

PART-A

1. Differentiate symmetric and asymmetric cipher. (CO2)
2. Explain the DES algorithm with a proper diagram. (CO2)
3. Explain different modes of operation of cryptographic algorithm with diagram. (CO1)
4. Explain the RSA algorithm with an example. (CO2)

PART-B

1. Explain the properties of collision-resistant hash function briefly. (CO3)
2. Explain the SHA algorithm for MAC generation with a proper diagram. (CO4)
3. Explain the SSL/TLS architecture in detail. (CO5)
4. Write processing steps/algorithm of DSA (Digital Signature Algorithm). (CO5)

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University Teaching Department

Re - Class Test (*July-December 2023*)

B. Tech. (H)-5th Semester

Branch: Data Science

Subject Name: Natural Language Processing **Subject Code: C128574(022)**

Max Marks: 40 **Min Marks:14** **Times: 2 hrs**

Note: Part a is compulsory, attempt any one questions from b and c.

CO: 1 Analyze the syntax, semantics, and pragmatics of a statement written in a natural language and Process the text data at syntactic and semantic level

CO: 2 Develop speech-based applications that use speech analysis (phonetics, speech recognition, and synthesis)

CO: 3 Extract information from text automatically using concept and Methods from NLP including stemming, n-gram, POS Tagging and Parsing

CO: 4 Analyze the text content to provide prediction related to specific domain using language model.

CO: 5 Develop Natural language Processing based Application.

Q.NO.		Questions	Marks	BL	CO
1	a	Define Natural language Processing.	2	L1	1
	b	List and Explain the challenges of NLP.	6	L2	1
	c	Explain the Various Applications of NLP.	6	L2	1
2	a	Define Regular Expression.	2	L2	2
	b	Explain the process of Dealing with various spelling errors.	6	L1	2
	c	Describe the consonant and its place of Articulations.	6	L3	2
3	a	What is POS Tagging	2	L1	3
	b	Explain Scope Ambiguity and attachment Ambiguity.	6	L3	3
	c	Explain Different types of Types of Tree Banks.	6	L2	3
4	a	What do you mean by Discourse Analysis.	2	L1	4
	b	Explain IR Model with suitable diagram.	6	L2	4
	c	Explain Types of Anaphora.	6	L2	4
5	a	Define Sentiment Analysis.	2	L3	5
	b	Explain the Application of Machine Translation based system.	6	L2	5
	c	Describe shallow parser.	6	L1	5

Chhattisgarh Swami Vivekanand Technical University
University Teaching Department
Re Class Test (July-December 2023)
B.Tech(H)-5th Semester(ReCT)
Branch: Data Science

Subject Name: Computational Complexity **Subject Code:C127532(022)**
Max Marks: 40 **Min Marks:14** **Times: 2 hrs**
Note: All questions are compulsory. Each question carries 8 marks.

Q.No.		Questions	Marks	BL	CO
	1	Illustrate briefly about P versus NP Class	8	L3	1
	2	Write and apply Longest Common Subsequence problem to solve the given problem: X=<STONE>, Y=<LONGEST>	8	L3	2
	3	Briefly describe about De Randomized Advanced Algorithm	8	L4	3
	4	Differentiate between Randomized algorithm and Polynomial Approximation algorithm with an example	8	L3	4
	5	Define Red-Black Tree and Show the red-black trees that result after successively inserting the keys 41,38,31,12,19,8 into an initially empty red-black tree.	8	L4	5