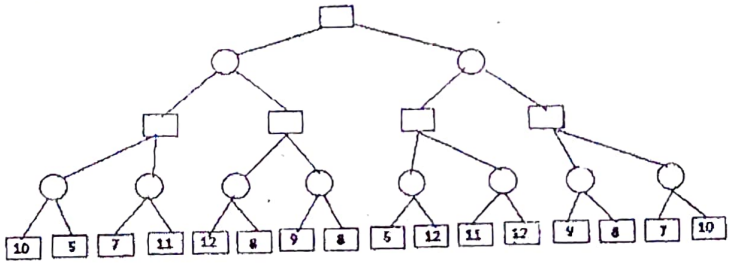
Dyotak :)

Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,

Department Of AI and DS, Year:2023-24 (Odd Sem) Test No.- 1

Class : Third Year	**Division: D11AD**
Semester :V	**Subject:Artificial Intelligence**
Date: 6/9/2023	**Time: 1 hr**

Q.1		**(Attempt any five of the following)**	**Marks (20)**	**COs**
	a)	What is intelligence? How do you measure it?	2M	CO1
	b)	Develop a PEAS for Chandrayaan 3 Pragya rover agent.	2M	CO3
	c)	Articulate heuristic function for the PAC-MAN game.	2M	CO2
	d)	Consider AI based game PUBG define environment types for the same	2M	CO3
	e)	Select a suitable agent design 1. Writing an intentionally funny story 2. Giving competent legal advice in a specialized area of low	2M	CO2
	f)	Determine properties of blind search : depth first search	2M	CO1
Q.2	a)	Explain Alpha Beta search and apply into the graph given below. 	5M	CO3
		OR		
	b)	Define the initial and goal state of three missionaries and cannibals problem. Describe the set of operators using if-then rules. Draw the entire state space graph (include only legal states, that is, states in which cannibals do not outnumber missionaries on either side of the river) . State best searching algorithm for it	5M	CO3
Q.3	a)	Give solution in order to overcome local maxima problem of hill climbing algorithm	5M	CO3
		OR		
	b)	Apply A* algorithm for solving 8-puzzle problem	5M	CO3

Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department Of AI&DS
Year:2023-24 (ODD Sem)
MID TERM TEST

Class : D11AD	**Division: A**
Semester: V	**Subject: Web Development**
Date: 05/09/2023	**Time: 9:00AM-10:00AM**

Q.1)		(Attempt any five of the following)	Marks (20)	COs Mapped
	a)	What is the DOM, and how does it relate to web development?	2M	1
	b)	Compare and contrast JSON with XML. What are the advantages of using JSON for data interchange in web applications?	2M	1
	c)	Write the purpose of HTTPS in web security. What encryption methods does it use, and why are they important?	2M	1
	d)	Differentiate between a URL (Uniform Resource Locator) and a URI (Uniform Resource Identifier).	2M	1
	e)	List the steps, essential tools and software required for setting up a React.js development environment for Windows OS.	2M	3
	f)	Write an example of how CSS style is set using JavaScript.	2M	2
Q.2)	a)	Illustrate by giving suitable example how Cookies are managed using JavaScript.	5M	2
		OR		
	b)	Illustrate by giving suitable example how Events are managed using JavaScript.	5M	2
Q.3)	a)	Define and differentiate between state and props in React components. Provide examples to illustrate their use.	5M	3
		OR		
	b)	Illustrate by providing suitable example life cycle of a React Component.	5M	3

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Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department Of Artificial Intelligence and Data Science,
Year:2023-24 (ODD Sem)
MID TERM TEST

Class : D11AD	**Division: NA**
Semester: 5th	**Subject: Cloud Computing**
Date: 04-09-2023	**Time: 9:00 AM - 10:00 AM**

Q.1)		(Attempt any five of the following)	Marks (20)	COs
	a)	How does virtualization play a crucial role in cloud computing, and what are the key benefits it provides to cloud infrastructure and services?	2M	CO2
	b)	Identify and describe two specific security challenges that organizations encounter when utilizing cloud computing in the contemporary digital environment.	2M	CO3
	c)	Compile a list of several challenges commonly encountered in the field of cloud computing?	2M	CO1
	d)	Categorize the different types of cloud computing environments based on their characteristics and usage.	2M	CO1
	e)	How does Amazon Web Services (AWS) differ from traditional hosting, and what are the primary categories of services it offers to users?	2M	CO1
	f)	Outline the key points of comparison between IT Outsourcing and Cloud Computing.	2M	CO3
Q.2)	a)	Write a detailed explanation of the architecture of a bare-metal hypervisor, highlighting its core components, their functions, and how they enable virtualization on physical hardware?	5M	CO2
		OR		
	b)	Identify the principal driving force behind the widespread adoption of cloud computing, and outline the primary advantages that cloud technology brings to Small and Medium-sized Businesses (SMBs)?	5M	CO3
Q.3)	a)	Write a detailed explanation of the architecture of the Xen hypervisor, outlining its core components and how they function together to facilitate virtualization on physical hardware?	5M	CO2
		OR		
	b)	Elaborate on the distinct types of cloud-based services, offering concrete examples for each category, and discuss the specific use cases and advantages associated with these services in the context of cloud computing?	5M	CO3

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Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department of Computer Engineering,
Year:2023-24 (ODD Sem)
MID TERM TEST

Class : All Branches	**Division: A/B/C**
Semester: V	**Subject: Bitcoin and Cryptocurrency**
Date: 14/9/2023	**Time: 4PM - 5PM**

Q.1)		(Attempt any five of the following)	Marks (20)	CO's Mapped
	a)	Why is a decentralized system followed in blockchain technology? Justify the same with the challenges of centralized systems.	2M	CO1
	b)	How is confidentiality and integrity handled using the P2P network in blockchain?	2M	CO1
	c)	Differentiate between Permissioned and Permissionless blockchain.	2M	CO1, CO2
	d)	Compute the mining difficulty for the given current target as: **current target = 0000000000005f67fd4a23b89c00000000000000000000**	2M	CO2
	e)	How miners pick transactions from mempool?	2M	CO2
	f)	What is 51% attack and give proactive measures to secure such a threat?	2M	CO2
Q.2)	a)	Elaborate the steps involved in the bitcoin transaction life cycle.	5M	CO3
		OR		
	b)	How does mining work in bitcoin? Explain with a suitable example	5M	CO2
Q.3)	a)	How the linking of the blocks in blockchain occurred? Explain it diagrammatically with the structure of the block.	5M	CO1
		OR		
	b)	What are blockchain forks? Discuss the various types of forks with a suitable diagram.	5M	CO2

Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department Of AI & DS,
Year:2023-24 (ODD Sem)
MID TERM TEST

Class : D11 AI & DS	**Division: –**
Semester: V	**Subject: Data Warehousing and Mining**
Date: 08/09/2023	**Time: 9 AM to 10 AM**

Q.1)		(Attempt any five of the following)	Marks (20)	CO's	BT
	a)	Define Data Mining. Explain five applications of Data mining.	2M	CO1	1,2
	b)	A multinational retail chain, "GlobalMart," seeking to analyze sales data for its various locations, will you recommend implementing a Data Warehouse or a Data Mart? Justify.	2M	CO1	1,2
	c)	Differentiate OLTP Vs OLAP.	2M	CO2	1,2
	d)	Consider a local cafe, "CaffeineFix," which aims to understand customer ordering habits.How does cleaning and organizing data, as part of preprocessing, improve the accuracy of analysis outcomes?	2M	CO1, CO2	1,2
	e)	List and explain the attribute selection techniques in the Decision Tree Algorithm.	2M	CO4	
	f)	Provide the main steps involved in KDD and how they can be utilized to enhance customer targeting for a promotional campaign in an e-commerce company.	2M	CO3	1,2
Q.2)	a)	Suppose that a data warehouse consists of the three dimensions time, doctor, and patient, and the two measures count and charge, where charge is the fee that a doctor charges a patient for a visit. Draw a star schema diagram for the above data warehouse.	5M	CO1	1,2, 3,4, 5
		OR			
	b)	Example No. | Color | Type | Origin | Stolen? 1 | Red | Sports | Domestic | Yes 2 | Red | Sports | Domestic | No 3 | Red | Sports | Domestic | Yes 4 | Yellow | Sports | Domestic | No 5 | Yellow | Sports | Imported | Yes 6 | Yellow | SUV | Imported | No 7 | Yellow | SUV | Imported | Yes 8 | Yellow | SUV | Domestic | No 9 | Red | SUV | Imported | No 10 | Red | Sports | Imported | Yes Use Naïve Bayesian techniques to Classify a Red Domestic SUV is getting stolen or not.	5M	CO4	1,2, 3,4, 5
Q.3)	a)	Use the methods below to normalize the following group of data: 200, 300, 400, 600, 1000 .(a) min-max normalization by setting min = 0 and max = 1 (b) z-score normalization standard deviation =282.2 and (c) normalization by decimal scaling	5M	CO3	1,2, 3,4, 5
		OR			

	b)	In a Snowflake schema, consider a database table that stores information about products, including their ID, name, and category. If the "Product Category" data is normalized into a separate table, explain how many tables would be involved in the Snowflake schema representation, and how these tables would be connected.	5M	CO1	

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End Semester Examination
Oct/Nov 2023

Max marks: 60 | Duration: 2 hours
Branch: Artificial Intelligence & Data Science | Semester: V
Name of the Course: Cloud Computing | QP Code: ADC501_032023-24
Course code: ADC501

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

Q.1	(a)	What is Cloud Computing? Explain its Types and Service delivery models in detail	10
	(b)	Explain the term XaaS with its underlying services in detail	10
Q.2	(a)	Explain the different Implementation Levels of Virtualization in brief	10
	(b)	Enlist and contrast different Cloud Network Topologies	10
Q.3	(a)	Explain the structures and mechanisms of virtualization in detail with examples	10
	(b)	What is Cloud Storage Gateway (CSG)? Explain the various characteristics of CSG in detail	10
Q.4	(a)	Explain the architecture of Mobile Cloud Computing in detail with its pros and cons	10
	(b)	Describe the SOA for Cloud applications with their types	10
Q.5	(a)	What are different factors for successful cloud deployment? Explain with example	10
	(b)	Write a short note on Identity Management as a Service	10

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End Semester Examination
Oct/Nov 2023

Max marks: 60 | Duration: 2 hours
Branch: Honours / Minor Degree- Blockchain | Semester: V
Name of the Course: Bit coin and Crypto currency | QP Code: HBCC501_012023-24
Course code: HBCC501

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

Q.1	(a)	Enlist the properties of cryptographic hash function. Describe the role of consensus mechanisms in maintaining the integrity of a blockchain and preventing double spending.	10
	(b)	Explain the process of adding transactions in the Blockchain with a neat diagram.	10
Q.2	(a)	What is meant by mempool and mining pool? How do transactions enter the mempool and What factors can affect the time a transaction spends in the mempool?	10
	(b)	Illustrate the process of mining in Bitcoin with a neat diagram.	5
	(c)	Differentiate between public and private blockchain (Write it in the tabular format)	5
Q.3	(a)	Explain Simplified Payment Verification (SPV) node and its role in the Bitcoin network.	10
	(b)	What information is included in a block header? Draw the structure of the Block and explain how the Merkle root of transactions is calculated and placed in the block header?	10
Q.4	(a)	Compare and contrast between symmetric and asymmetric cryptography with a neat diagram.	10
	(b)	Describe the process of network discovery in the context of Bitcoin and how new nodes find and connect to the network.	10
Q.5	(a)	Explain HD (Hierarchical Deterministic) wallet and how do BIP-32 and BIP-44 standards enhance wallet functionality and security?	10
	(b)	Why is it important for Bitcoin nodes to establish encrypted and authenticated connections, and what methods are used to achieve this?	5
	(c)	What is mining difficulty in the context of Bitcoin, and how does it adjust over time?	5

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End Semester Examination
Oct/Nov 2023

Max marks: 60 | Duration: 2 hours
Branch: Artificial Intelligence and Data Science | Semester: V
Name of the Course: Web Development | QP Code: ADC502_022023-24
Course code: ADC502

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

Q.1	(a)	Draw and illustrate the working architecture of web browsers. Give an example of HTTP request and HTTP response header.	10
	(b)	Consider an online alumni information web page on your college website. Create forms to get name, address, date of birth, and email id. Use check boxes for taking hobbies and radio buttons for selecting branch name. Write JavaScript code to validate the following: i. User has filled all the fields prior to form submission ii. Valid email-id (with '@' and '.') iii. Age validation using DOB (>=21 years)	10
Q.2	(a)	What are hooks in React and how are they used? Explain it with a suitable example.	10
	(b)	Explain various DOM objects of Javascript. Write Javascript code to change the background color of a web page automatically after every 5 seconds.	10
Q.3	(a)	Describe Model-View-Controller framework. How is the MVC framework applied in React? Illustrate it with a suitable example.	10
	(b)	Explain JSON data types in short.	5
	(c)	What are React refs and how are they used in functional components? Discuss it with any one use case.	5
Q.4	(a)	How does the Filesystem module in Node.js facilitate reading and writing files? Provide an example.	10
	(b)	Describe the concept of streams in Node.js and give examples of scenarios where they are useful.	10
Q.5	(a)	How does Flow architecture enhance the development of a React application, and what are its key components?	10
	(b)	What is a RESTful API and how does Express and node.js facilitate the creation of REST APIs?	10

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End Semester Examination
Oct/Nov 2023

Max marks: 60 Marks | Duration: 2 hours
Branch: Artificial Intelligence & Data Science | Semester: Semester - V
Name of the Course: Artificial Intelligence | QP Code: ADC503 _012023-24
Course code: ADC503

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

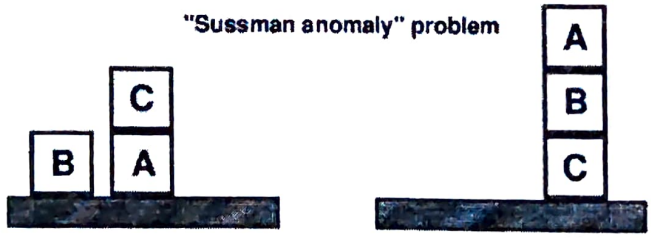
Q.1 (a) Describe the PEAS descriptor for AI agent based Playing a tennis match 5

(b) Write the Environment properties for an agent ordering in restaurant 5

(c) Can Machines Act/Think Intelligently? Justify your answer? 5

(d) How to write an agent which does Right Thinking? 5

Q.2 (a) Explain partial order planning. Solve following problem using partial order planning. 10



(b) State Space Representation using Variables for Given a full 5-gallon jug and an empty 2-gallon jug, the goal is to fill the 2-gallon jug with exactly one gallon of water. 5

(c) Explain Ontology in AI. 5

Q.3 (a) Examine which type of learning is best for healthcare domain. 10

(b) Consider the following Knowledge Base: 10

1. The humidity is high or the sky is cloudy.
2. If the sky is cloudy, then it will rain.
3. If the humidity is high, then it is hot.
4. It is not hot.

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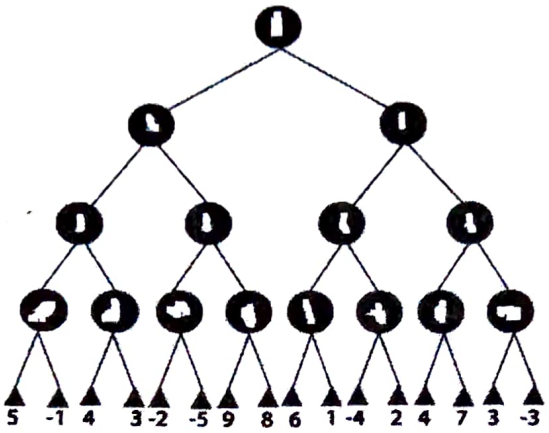
Goal: It will rain.
Prove using resolution graph.

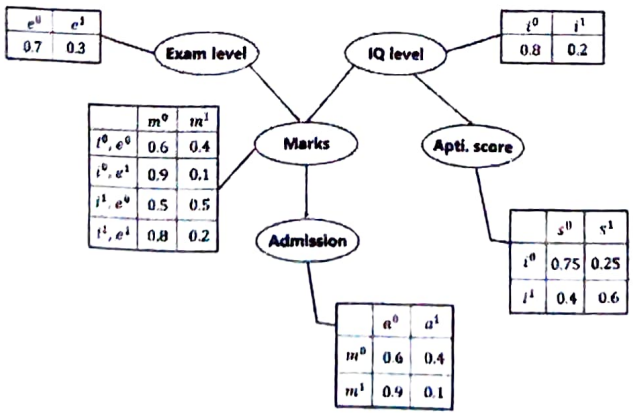
Q.4 (a) Explain min max algorithm. Apply on the given tree. State applications of it. 10



(b) Describe local search technique. Explain any one local search technique with example. 10

Q.5 (a) Explain A* algorithm with an example along with its properties. 10

(b) Explain Bayesian Belief Network. Calculate the probability that in spite of the exam level being difficult, the student having a low IQ level and a low Aptitude Score, manages to pass the exam and secure admission to the university. 10



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End Semester Examination
Oct/Nov 2023

Max marks: 60 | Duration: 2 hours
Branch: Artificial Intelligence & Data Science | Semester: V
Name of the Course: Data Warehousing & Mining | QP Code: ADC504_012023-24
Course code: ADC504

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

Q.1 (a) Explain the elements of dimensional modeling. 5

(b) What are the major issues in data mining? 5

(c) What is Noisy data? How to handle it? 5

(d) Define and explain: i) Support ii) Confidence iii) Information Gain iv) Entropy 5

Q.2 (a) Suppose that a data warehouse for a big university consists of the following 4 dimensions: student, course, semester and instructor and two measures count and avg_grade. When at the lowest conceptual level (e.g. for a given student, course, semester and instructor combination), the avg_grade measure stores the actual course grade of the student. At the higher conceptual layer, the avg_grade measure stores the average grade for the given combination. 10

(a) Draw a snowflake schema diagram for a data warehouse.
(b) Starting with the base cuboid [student, course, semester, instructor], what specific OLAP operations (e.g. roll up from semester to year) should one perform in order to list the average grade of CS courses for each Big university student.

(b) Explain DBSCAN clustering algorithm with an example. 10

Q.3 (a) Given two objects represented by the tuples (22, 1, 42, 10) and (20, 0, 36, 8): 10

(a) Compute the Euclidean distance between the two objects.
(b) Compute the Manhattan distance between the two objects.
(c) Compute the Minkowski distance between the two objects, using q = 3.
(d) Compute the supremum distance between the two objects

(b) Define classification. Explain ID3 algorithm with an example. 10

Q.4 (a) Explain data warehouse architecture. 10

(b) Consider following transactions .Generate Association rules using Apriori algorithm. 10
Given : Min support = 30%, Confidence = 75%

TID	List of Items
T1	E, A, D, B
T2	D, A, C, E, B
T3	C, A, B, E
T4	B, A, D
T5	D
T6	D, B
T7	A, D, E
T8	B, C

Q.5 (a) Consider the given dataset. Apply Naive Bayes' Algorithm and predict the type of fruit if fruit has properties as {Yellow,Sweet,long} 10

Frequency Table:

Fruit	Yellow	Sweet	Long	Total
Mango	350	450	0	650
Banana	400	300	350	400
Others	50	100	50	150
Total	800	850	400	1200

(b) Explain different types of web mining. 10

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Vivekanand Education Society's Institute of Technology

An Autonomous Institute Affiliated to University of Mumbai

End Semester Examination
Oct/Nov 2023

Max marks: 60 | Duration: 2 hours
Branch: Artificial Intelligence & Data Science | Semester: VII
Name of the Course: Statistics for Artificial Intelligence & Data Science | QP Code: ADLO5011 _032023-24
Course code: ADL05011

N.B. (1) Attempt any three out of the five questions.
(2) Figures to the right indicate full marks.
(3) Assume suitable data if necessary

Q.1 (a) A coin is tossed four times. Calculate the probability of obtaining more heads than tails 5

(b) What do you mean by sampling distribution of sample means? 5

(c) For the following problem, use the following scores: 5, 8, 8, 8, 7, 8, 9, 12, 8, 9, 8, 10, 7, 9, 7, 6, 9, 10, 11, 8 10
a. Create a histogram of these data. What is the shape of this histogram?
b. Compute the sample mean, the median, and the mode and std deviation.

Q.2 (a) Illustrate Boxplots with an example. Highlight its advantage. 5

(b) What is the Central Limit Theorem? 5

(c) In a Study, 12 participants were divided into three groups of 4 each, they were subjected to three different conditions, A (Low Noise), B (Avearge Noise), and C (Loud Noise). They were given a test and the errors committed by them on the test were noted and are given in the table below. 10

Participant No.	Condition A (Low Noise)	Participant No.	Condition B (Average Noise)	Participant No.	Condition C (Loud Noise)
1	3	5	2	9	10
2	5	6	7	10	8
3	6	7	9	11	7
4	3	8	8	12	11

The researcher wishes to know whether these three conditions differ amongst themselves and there are no assumptions of the probability.(Table value is 5.692)

Q.3 (a) The average number of accidents at a particular intersection every year is 18. 10

i. Calculate the probability that there are exactly 2 accidents there this month.
ii. Calculate the probability that there is at least one accident this month.
iii. What is the probability that there are more than 2 accidents in a particular month?

(b) Explain Type I and Type II errors. If our null hypothesis is "H0: μ=40", what are the three possible alternative hypotheses? 5

(c) The average weight of a water bottle is 30 kg with a standard deviation of 1.5 kg. If a sample of 45 water bottles is selected at random from a consignment and their weights are measured, then what is the probability that the mean weight of the sample is less than 28 kg? 5

Q.4 (a) While tracking a playing team's performance it was found that the scores are normally distributed with μ= 78 and σ= 12. Recently, a new person joined the team, and the team manager thinks the scores have gotten better. Use hypothesis testing to see if the average score has improved based on the following 8 weeks' worth of score data: 82, 74, 62, 68, 79, 94, 90, 81, 80. (z table value is 2.54) 10

(b) Why do we require analysis of variance? What are the three pieces of variance analysed in ANOVA? Distinguish between one-way and two-way ANOVA with examples. 10

Q.5 (a) You are assigned to run a study comparing a new medication ($\bar{X}$ = 17.47, n= 19), an existing medication ($\bar{X}$= 17.94, n= 18), and a placebo ($\bar{X}$ = 13.70, = 20), with higher scores reflecting better outcomes. Use SSB=210.10 and SSW= 133.90 to test for differences. (Hint: df1=2, df2=54) 10

(b) Find the simple linear regression equation for the data given below: 10

X	Y
2	21
4	27
6	29
8	64
10	86
12	92

X------X------X-----X