

Dyotak :)

Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department Of Artificial Intelligence and Data Science

Year:2022-23 (ODD Sem)

Internal Assessment Test 1

Class : D11AD	Division:-N.A.
Semester : V	Subject: Computer Network
Date: 06/09/2022	Time: 1 hr

Course Outcome	CO1	CO2
Percentage %	50%	50%	

Q.1)		(Attempt any five of the following)	Mark s	Course Outcomes
			(20)	
	a)	What are the function of data link layer?	2M	CO2
	b)	Differentiate between OSI and TCP /IP reference models.	2M	CO I
	c)	Define Topology. What is Mesh Topology in computer network?	2M	CO 1
	d)	List the advantages of fiber optics as a communication medium.	2M	CO 2
	e)	Differentiate between LAN, MAN and WAN.	2M	CO 1
	f)	What is framing in data link layer?	2M	CO 2
Q.2)	a)	Explain design issues of data link layer. Explain Stop and Wait data link protocol.	5M	CO 2
		OR		
	b)	Explain Cyclic Redundancy Checks (CRC) with example.	5M	CO 2
Q.3)	a)	Explain different type of devices used in computer network.	5M	CO 1
		OR		
	b)	What is the significance of layered architecture? Explain the OSI layered architecture with neat sketch.	5M	CO 1

~ All the best!!! ~

**Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department Of AI and DS,
Year:2022-23 (Odd Sem)**

Test No.- 1

Class: Third Year

Division: D11AD

Semester: V

Subject: Artificial Intelligence

Date: 08/09/2022

Time: 1 hr

Course Outcome	CO1	CO2	CO3	CO4	CO5	CO6
Percentage %	13%	13%	74%	-	-	-

Q.1	(Attempt any five of the following)			Marks (20)	COs
	a)	What is intelligence? How do you measure it?			2M CO1
	b)	List and describe problems faced in Hill Climbing Search?			2M CO3
	c)	What do you mean by Problem formulation. Explain by taking suitable example.			2M CO2
	d)	Differentiate uninformed and informed search strategies. Which one is better and Why?			2M CO3
	e)	Give the initial state, goal test, successor, and cost function for 8 queen problem			2M CO2
	f)	Why PEAS is important? Find out PEAS for automated taxi driver.			2M CO1
Q.2	a)	Explain Alpha Beta search and apply into the 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)	Explain Genetic Algorithm in detail with suitable example.			5M CO3
	OR				
	b)	Explain a heuristic function for an 8-puzzle problem and solve it using A* algorithm?			5M CO3

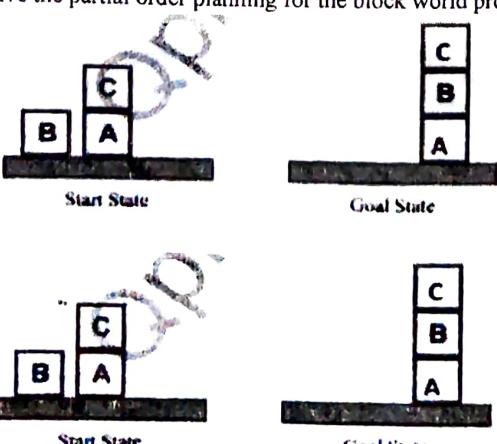
Class : D11 AI & DS	Division: D11 AI & DS
Semester : V	Subject: Data Warehousing and Mining
Date: 17-10-2022	Time: 1 hr

Q.1)	(Attempt any five of the following)	Marks (20)																				
a)	What are outliers?	2M																				
b)	What are different attribute selection methods in the Decision Tree induction algorithm?	2M																				
c)	What are dendograms?	2M																				
d)	Explain clustering.	2M																				
e)	What is web structure mining?	2M																				
f)	Why is naive Bayesian classification called naive?	2M																				
Q.2)	a) Explain k- means clustering.	5M																				
	OR																					
b)	Explain Decision tree based classification algorithm with an example.	5M																				
Q.3)	a) Explain Apriori Algorithm.	5M																				
	OR																					
b)	Apply Apriori Algorithm and find all frequent item set and strong association rules. minimum support count =2 and minimum confidence=70% <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>Transaction ID</th> <th>Items</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>1, 2, 5</td> </tr> <tr> <td>200</td> <td>2, 4</td> </tr> <tr> <td>300</td> <td>2, 3</td> </tr> <tr> <td>400</td> <td>1, 2, 4</td> </tr> <tr> <td>500</td> <td>1, 3</td> </tr> <tr> <td>600</td> <td>1, 3</td> </tr> <tr> <td>700</td> <td>1, 3, 2, 5</td> </tr> <tr> <td>800</td> <td>1, 3</td> </tr> <tr> <td>900</td> <td>1, 2, 3</td> </tr> </tbody> </table>	Transaction ID	Items	100	1, 2, 5	200	2, 4	300	2, 3	400	1, 2, 4	500	1, 3	600	1, 3	700	1, 3, 2, 5	800	1, 3	900	1, 2, 3	5M
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Test No.- 2

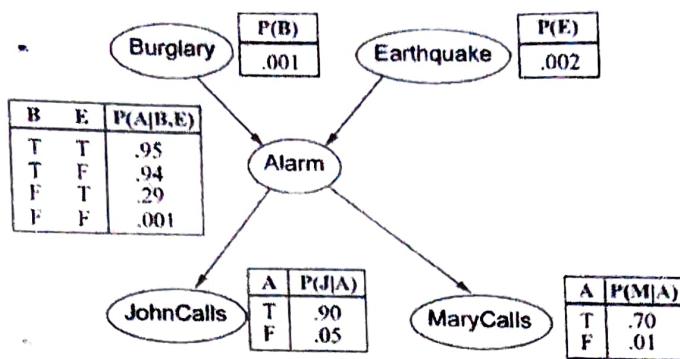
Class: Third Year	Division: D11AD
Semester: V	Subject: Artificial Intelligence
Date: 15/10/2022	Time: 1 hr

Course Outcome	CO1	CO2	CO3	CO4	CO5
Percentage %	--	-	6%	80%	13%

Q.1	(Attempt any five of the following)		Marks (20)	COs
	a)	Distinguish between Propositional Logic (PL) and First Order Predicate Logic (FOPL) knowledge representation mechanisms	2M	CO4
	b)	What is unsupervised learning? give one example	2M	CO5
	c)	Describe the environment characteristics of WUMPUS world puzzle	2M	CO4
	d)	State which type of learning (supervised, unsupervised and reinforcement) is applied in following cases 1. Self-Driving Cars 2. Risk Evaluation 3. Forecast Sales 4. Anomaly Detection	2M	CO5
	e)	Formalize the above sentences in propositional logic: "If Gianni is not lucky and he is not fit, he does not climb mount Everest"	2M	CO4
	f)	Explain knowledge base agent	2M	CO3, CO4
Q.2	a)	Consider the following sentences Anyone passing his history exam and winning a lottery is happy. But anyone who studies or is lucky can pass all his exams. Jhon did not study but he is lucky. anyone who is lucky wins the lottery. Answer "Is John happy?" using proof by resolution	5M	CO4
	OR			
	b)	Convert the given facts to predicate logic and CNF. Also, prove the statement: "Raja is angry" using the Resolution Graph. 1. Rimi is hungry 2. If Rimi is hungry she barks 3. If Rimi is barking, then Raja is angry	5M	CO4
Q.3	a)	Give the partial order planning for the block world problem	5M	CO4
				

OR

- b) From the given BAYESIAN BELIEF NETWORK state, what is the probability of John call?



5M

CO4

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

Department Of Artificial Intelligence and Data Science

Year:2022-23 (ODD Sem)

Internal Assessment Test 2

Class: D11A	Division:
Semester: 5	Subject: Web Computing
Date: 14 th October 2022 (9 am – 10 am)	Time: 1 hr.

Course Outcome	CO3	CO4	CO5	CO6
Percentage %	20	30	20	30

Q.1)		(Attempt any five of the following)	Marks (20)	Course Outcomes
	a)	What is Express Generator?	2M	CO4
	b)	How is Asynchronous Programming done in Node js?	2M	CO6
	c)	Explain Props. What do you mean by Default props?	2M	CO3
	d)	Explain REPL	2M	CO6
	e)	Difference between Stateful and Stateless Component	2M	CO5
	f)	Explain Cookies in Express	2M	CO4
Q.2)	a)	Explain the Component Lifecycle with a neat Diagram	5M	CO5
		OR		
	b)	What do you mean by Nodejs? What are its features? WAP to create an app in Nodejs	5M	CO6
Q.3)	a)	What is Middleware in Express? State its Types with appropriate example	5M	CO4
		OR		
	b)	Explain Forms and their types with example	5M	CO3

~ All the best!!! ~

Vivekanand Education Society's Institute of Technology, Chembur, Mumbai,
Department Of Artificial Intelligence and Data Science
Year:2022-23 (ODD Sem)
Internal Assessment Test 2

Class : D11AD	Division:-N.A.
Semester : V	Subject: Computer Network
Date: 13/10/2022	Time: 1 hr

Course Outcome	CO2	CO3	CO4	CO5	CO6
Percentage %	23.33	30	30	6.66	16.66

Q.1)		(Attempt any five of the following)	Marks (20)	Course Outcomes
	a)	Define FTP.	2M	CO5
	b)	Compare the throughput of pure aloha and slotted aloha.	2M	CO2
	c)	What are TCP and UDP protocols?	2M	CO4
	d)	List out the transport layer service primitives and their meaning	2M	CO4
	e)	What is Subnetting.	2M	CO3
	f)	Distinguish between IPV4 vs IPv6 Protocol.	2M	CO3
Q.2)	a)	Describe the working principle of Carrier sense multiple access with collision Detection (CSMA/CD).	5M	CO 2
		OR		
	b)	What is the format of IPv4 header? Describe the significance of each field	5M	CO 3
Q.3)	a)	With an example explain the sliding window Flow control mechanism.	5M	CO 4
		OR		
	b)	Describe the three layers of the SONA framework.	5M	CO 6

~ All the best!!! ~

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

Department Of Artificial Intelligence and Data Science

Year:2022-23 (Even Sem)

Internal Assessment Test 2

Class : D11 AD	Division: --
Semester : VI	Subject: Machine Learning
Date: 24/3/2023 (9:00 AM to 10:00 AM)	Time: 1 hr

Course Outcome	CO2	CO4	CO5
Percentage %	30	10	60

Q.1)	(Attempt any five of the following)		Marks (20)	Course Outcomes	
	a) Compare Biological neuron and artificial neuron?			CO5	
	b) Discuss the techniques used to calculate Symmetric Positive Definite Matrices?			CO2	
	c) What will happen if we do not apply activation function to the net input of neuron ?			CO4, CO5	
	d) Explain hebbain network rules for weight update and its weight update formula?			CO4, CO5	
	e) State application of Singular value decomposition?			CO2	
	f) Summarize the Problem of MP neuron?		2M	CO5	
Q.2)	a) Find the weights required to perform the following classification using perceptron network. The vectors(1,1,1,1) and (-1,1,-1,-1) have target value 1. Vectors (1,1,1,-1) and (1,-1,-1,1) have target class -1. Assume learning rate 1, initial weight as 0 and threshold 0.2 Perform up to 1 epoch only.		5M	CO5	
	b) Explain the backpropagation algorithm with one hidden layer? Also, explain the chain rule for weight update?		5M	CO5	
Q.3)	a) Diagonalize the Matrix $A = \begin{pmatrix} 2 & 0 & 2 \\ -1 & 2 & 1 \\ 0 & 1 & 4 \end{pmatrix}$		0	CO2	
	b) Explain Mdaline Network with Delta weight update rule?		5M	CO5	

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

Department Of Artificial Intelligence and Data Science

Year:2022-23 (Even Sem)

Internal Assessment Test 1

Class : D11 AD	Division: --
Semester : VI	Subject: Machine Learning
Date: 16/02/2023 (9 am to 10 am)	Time: 1 hr

Course Outcome	CO1	CO2	CO3
Percentage %	30	50	20

Q.1)	(Attempt any five of the following)		Marks (20)	Course Outcomes	
	a) Define Orthonormal vector and give its example?			CO2	
	b) How would you express the need for cross validation ?			CO1	
	c) What can you infer from SVM Kernels?			CO3	
	d) What do you understand by the term Regularization? State the formula for L1 and L2 Regularization?			CO3	
	e) How to measure the magnitude of a vector?			CO2	
	f) What are tensors and state different type of tensors?			CO2	
Q.2)	a)	Elaborate the difference between Overfitting vs under fitting and techniques used to solve this problem?	5M	CO1	
	OR				
	b)	Find the Eigen values and Eigen Vectors of the matrix $A = \begin{pmatrix} 14 & -10 \\ 5 & -1 \end{pmatrix}$	5M	CO2	
Q.3)	a)	What criteria will you use to measure the performance in i) Classification Problem with imbalance dataset ii) Classification Problem in case of medical diagnosis iii) Regression Problem Justify your answer and express formula for the chosen performance measure?	5M	CO1	
	OR				
	b)	Explain Gradient Descent algorithm and how it optimize the loss function?	5M	CO2	

~ All the best!!! ~

TE | A1 & DS | Sem- V (C-2019) | Nov-2022

Time: 3 hours

Max. Marks: 80

N.B. (1) Question one is Compulsory.

(2) Attempt any 3 questions out of the remaining.

(3) Assume suitable data if required.

- | | | |
|------|---|----------------------|
| Q. 1 | a) Compare and contrast Circuit switched network and Packet switched network | 05 |
| | b) Describe the different guided transmission medias used in the network | 05 |
| | c) What is Channel Allocation problem? explain in short pure and slotted ALOHA | 05 |
| | d) Obtain the 4-bit CRC code for the data bit sequence 10011011100 using the polynomial $x^4 + x^2 + 1$ | 05 |
| Q 2 | a) Describe in detail OSI reference model with a neat diagram | 10 |
| | b) What is Channel allocation problem? Explain CSMA/CD protocol. A network with CSMA/CD has 10 Mbps bandwidth and 25.6ms maximum propagation delay. What is the minimum frame size? | 10 |
| Q 3 | a) Compare and contrast between
i) IPv4 vs IPv6
ii) Connection oriented protocol vs Connectionless protocol | 10 |
| | b) Explain in brief Cisco PPDOO Network design Methodology | 10 |
| Q 4 | a) What is SDN? Explain SDN architecture along with Operations of control and data planes | 10 |
| | b) What is Routing? What are desirable characteristics of routing algorithms? Explain distance vector routing with suitable example | 10 |
| Q 5 | a) Elaborate the architectures of NOX and POX controllers of SDN with their comparison | 10 |
| | b) Elaborate Cisco SONA Architecture in detail | 10 |
| Q 6 | Write a short note on
a) Sliding Window Protocol
b) OpenFlow messages
c) NAT
d) DHCP | 05
05
05
05 |

G.P. Code .

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Page 1 of 1

[3 hrs]

[80 Marks]

- Note:
1. Question 1 is compulsory
 2. Answer any three out of remaining question
 3. Assume suitable data where required.

Q1

- A. What is PEAS descriptor? Give PEAS descriptor for robot maid for cleaning the house. [5]
- B. Discuss different applications of AI. [5]
- C. Draw and explain architecture of Expert System. [5]
- D. In a class, there are 80% of the students who like English and 30% of the students who likes English and Mathematics, and then what is the percentage of students those who like Math, also like English? Solve it using Conditional probability. [5]

Q2

- A. Define chromosome, selection, fitness function, cross over and mutation as used in Genetic Algorithm. Explain how Genetic Algorithm in works. [10]
- B. Draw and describe the architecture of Utility based agent. How is it different from Model based agent? [10]

Q3

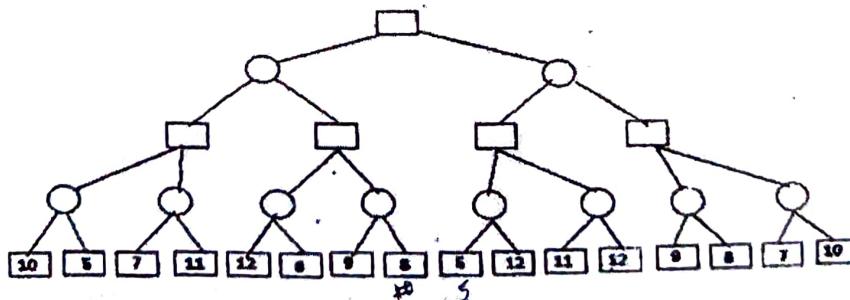
- A. Explain A* algorithm in detail. [10]
- B. Define belief Network. Describe the steps of constructing belief network with an example. [10]

Q4

- A. Illustrate forward chaining and backward chaining in propositional logic with example. [10]
- B. Explain different types of learning in AI. [10]

Q5

- A. Consider the following axioms
All people who are graduating are happy.
All happy people smile.
Someone is graduating.
Prove that "Is someone Smiling?" using resolution technique. Draw resolution tree.
- B. Explain Alpha-beta pruning algorithm. Apply alpha beta pruning on following example considering first node as MAX. [10]



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Department Of Artificial Intelligence and Data Science**

Year:2022-23 (ODD Sem)

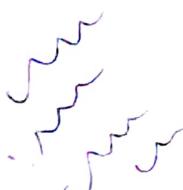
Internal Assessment Test 1

Class: D11A	Division:
Semester: 5	Subject: Web Computing
Date: 7 th September 2022 (9 am – 10 am)	Time: 1 hr.

Course Outcome	CO1	CO2
Percentage %	40	60	

Q.1)	(Attempt any five of the following)			Marks (20)	Course Outcomes	
	a)	Difference between ES5 and ES6			2M CO2	
	b)	What is an URI? Explain URN and URL with a neat diagram			2M CO1	
	c)	What do you mean by Event Handling in JavaScript?			2M CO2	
	d)	Explain const, var and let keywords with example.			2M CO2	
	e)	Difference between XML and JSON			2M CO1	
	f)	What makes an API Restful?			2M CO1	
Q.2)	a)	Does JavaScript support Inheritance? If yes, explain Inheritance, and types of Inheritance with programs as example for each type.			5M CO2	
		OR				
	b)	What do you mean by TLS? How is it different from SSL? Explain TLS handshake with a neat diagram.			5M CO1	
Q.3)	a)	What are functions? What are the different types of function based on arguments and return types? Explain each with program. Also explain recursive function with an example			5M CO2	
		OR				
	b)	What do you mean by Iterables? Explain Iterators and Generators with example.			5M CO2	

~ All the best!!! ~



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

Department Of Artificial Intelligence and Data Science

Year:2022-23 (ODD Sem)

Internal Assessment Test 1

Class : D11 AI & DS	Division: D11 AI & DS
Semester : V	Subject: Data Warehousing and Mining
Date: 10-09-2022	Time: 1 hr

Q.1)	(Attempt any five of the following)	Marks (20)	
a)	Explain the features of Data warehouse	2M	
b)	Explain the KDD process.	2M	
c)	Compare Datawarehouse Vs Data Mart	2M	
d)	Differentiate OLTP Vs OLAP	2M	
e)	Explain issues in Data mining.	2M	
f)	List different data cleaning techniques.	2M	
Q.2)	Suppose that a data warehouse consists of the four dimensions, date, spectator, location, and game, and the two measures, count and charge, where charge is the fare that a spectator pays when watching a game on a given date. Spectators may be students, adults, or seniors, with each category having its own charge rate. (a) Draw a star schema diagram for the data warehouse. (b) Starting with the base cuboid [date, spectator, location, game], what specific OLAP operations should one perform in order to list the total charge paid by student spectators at GM Place in 2010?	5M	
	OR		
	b)	Briefly compare the following concepts: (a) Snowflake schema, fact constellation, starburst query model (b) Data cleaning, data transformation,	5M
Q.3)	a)	Explain Data Pre processing in detail	5M
		OR	
	b)	Explain Data transformation in detail	5M

~ All the best!!! ~

Paper / Subject Code: 48814 / Data warehousing & Mining
/ AI & DS / SEM-IV (c-2019) / NOV. 2022

Time: 3 hours

Max. Marks: 80

N.B. (1) Question one is Compulsory.

- (2) Attempt any 3 questions out of the remaining.
- (3) Assume suitable data if required.

Q. 1	(a) Explain features of data warehouse. 05 (b) Demonstrate with diagram the process of KDD. 05 (c) What is Market basket analysis? 05 (d) Explain with example confusion matrix, accuracy and precision. 05
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Q. 2 a) Suppose that a data warehouse for Big_University consists of the four dimensions Student, Course, Semester and Instructor, and two measures count and avg_grade, where count is the number of students and average grade is the course grade of the student.

Perform following tasks:

- i. Design the star schema for the Big_University. 10
- ii. Create a base cuboid for the Big_university database and apply different OLAP operations.
- b) What is clustering? Explain K-mean clustering algorithm. Suppose that the data mining task is to cluster the following items into two clusters.
 $\{2, 4, 10, 12, 3, 20, 30, 11, 25\}$. Apply k-means algorithm. 10

- Q. 3 a) Explain ETL process in detail. 10
 b) Consider the transaction database given below:
 Use Apriori Algorithm with min-support count= 2 and min-confidence = 60%, to find frequent itemset and strong association rules. 10

TID	Items
10	1, 3, 4
20	2, 3, 5
30	1, 2, 3, 5
40	2, 5
50	1, 3, 5

Q. 4 a) Illustrate any one classification technique for the following dataset.

Show how we can classify new tuple (**Homeowner=YES, Status=Employed, Income= Average**). 10

Sr. No	Homeowner	Status	Income	Defaulted
1	Yes	Employed	High	No
2	No	Business	Average	No
3	No	Employed	Low	No
4	Yes	Business	High	No
5	No	Unemployed	Average	Yes
6	No	Business	Low	No
7	Yes	Unemployed	High	No
8	No	Employed	Average	Yes
9	No	Business	Low	No
10	No	Employed	Average	Yes

- b) What is web mining? Explain web content mining in detail 10

Paper / Subject Code: 48814 / Data warehousing & Mining

- Q. 5 a) Explain different data cleaning techniques. 10
b) Clearly explain the working of DBSCAN algorithm using appropriate diagram 10
- Q.6 a) Explain Multidimensional and multilevel rule mining with example. 10
b) Explain with example different data sampling techniques. 10
-

TE/AI&DS/SEM-V(c-2019)/DEC. 2022

[Time: 3 Hours]

[Marks:80]

- N.B. 1. Question No. 1 is compulsory.
2. Attempt any three questions out of remaining five.
3. All questions carry equal marks
4. Assume Suitable data, if required and state it clearly.

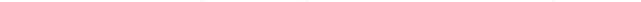
Q.1 Attempt any four;

20

- a) Find the standard deviation of the average temperatures recorded over a five-day period last winter: 19, 21, 18, 24, 12?
 - b) X is a normally distributed variable with mean $\mu = 30$ and standard deviation $\sigma = 4$. Find:
 - i) $P(x < 40)$, ii) $P(30 < x < 35)$?
 - c) Discuss Boot strapping vs. re-sampling
 - d) The school principal wants to test if it is true what teachers say – that high school juniors use the computer an average 3.2 hours a day. What are our null and alternative hypotheses?
 - e) What do you mean by correlation and regression? Explain with example

Q.2 a) Find the value of the correlation coefficient from the data given in the following table:

SUBJECT	AGE (X)	GLUCOSE LEVEL(Y)
1	43	99
2	21	65
3	25	79
4	42	75
5	57	87
6	59	81

b)  10

Explain briefly why ANOVA is used? Solve using One-way ANOVA

OBSERVATIONS	A	B	C
1	25	31	24
2	30	39	30
3	36	38	28
4	38	42	25
5	31	35	28

method:

Q.P.CODE
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- Q.3** a) Explain type I & type 2 error in detail. 10
 (ii) What is the use of scatter plot and box plot?
- b) In a manufacturing unit, four teams of operators were randomly selected and sent to four different facilities for machining techniques training. After the training, the supervisor conducted the exam and recorded the test scores. At 95% confidence level does the scores are same in all four facilities?
 (Hint: Use Kruskal-Wallis test)

Facility 1	Facility 2	Facility 3	Facility 4
88	77	71	52
82	76	56	65
86	84	64	68
87	59	51	81

- Q.4** a) If the sample mean and expected mean value of the marks obtained by 15 students in a class test is 290 and 300 respectively. What is the t-score if the standard deviation of the marks is 50? 10
 b) Find out what is the relation between the GPA of a class of students and the number of hours of study and the height of the student 10

GPA	Height	Study Hours
2.9	66	7
3.16	57	7
3.62	64.5	6
2	62	7
3.45	69.5	8
2.8	65	9
3.63	63	6
2.81	68	5
3.33	59.5	4
2.75	64	10
3.86	69	7

- Q.5** a) A farmer is trying out a planting technique that he hopes will increase the yield on his pea plants. The average number of pods on one of his pea plants is 145 pods with a standard deviation of 100 pods. This year, after trying his new planting technique, he takes a random sample of his plants and finds the average number of pods to be 147. He wonders whether this is a statistically significant increase. What are his hypotheses and the test statistic? Use a 0.05 significance level.
 b) Find the simple linear regression equation that fits the given data and coefficient of determination: 10

Hour	Temp
2	21
4	27
6	29
8	86
10	86
12	92

TE/AI&DS/SEM-V(c.2019)/DEC.2022

- Q.6 a) An agent sells life insurance policies to five equally aged, healthy people. According to recent data, the probability of a person living in these conditions for 30 years or more is $\frac{2}{3}$. Calculate the probability that after 30 years if 10
- i. All five people are still living.
 - ii. At least three people are still living.
 - iii. Exactly two people are still living. (Hint: Binomial Distribution)
- b) Write short notes on (any two) 10
- i. Confidence Interval
 - ii. Central Limit Theorem
 - iii. Standard Error