VIT
Vellore Institute of Technology

Reg. No. : 20BCE1707

Final Assessment Test (FAT) - November/December 2023

Programme	**B.Tech.**	Semester	**FALL SEMESTER 2023 - 24**
Course Title	**ARTIFICIAL INTELLIGENCE**	Course Code	**CSE3013**
Faculty Name	**Prof. Benil T**	Slot	**C2+TC2**
		Class Nbr	**CH2023240100212**
Time	**3 Hours**	Max. Marks	**100**

PART -A (5 X 10 Marks)
Answer all questions

01. i) List all the properties of task environments applicable for Chandrayan-3 (4 marks) **[10]**

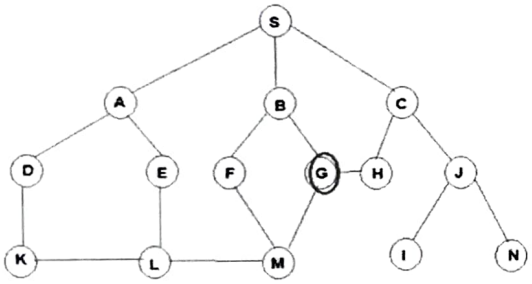
ii) Give the PEAS description of the following applications

a) Chandrayan-3 safe landing on the moon (2 marks)

b) Shopping for used books in the Internet (2 marks)

c) Autonomous self-driving car (2 marks)

02. Given varies cities, you are supposed to travel from source (s) and reach goal (g). Find the path to reach the goal state for various conditions by answering the following queries, **[10]**



i) Reach G from S, applying intensive search using a stack to remember the next vertex. (4 marks)

ii) Reach G from S, applying a kind of shallow search using a queue to remember the next vertex (4 marks)

iii) Investigate the outcome of a Depth-Limited Search (DLS) when a predetermined depth limit is set at 2. (2 marks)

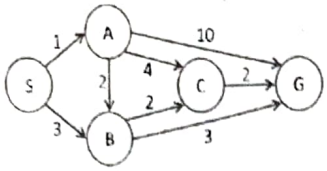
03. Consider our college, where you need to travel from Hostel block (S) to Delta block Class room (G). The actual path cost projects the time (in minutes) between various nodes based on the graph given below : **[10]**

· certain buildings in-between

· potential obstacles

· dynamic factors like pedestrian traffic

Find the most efficient and optimal time (in minutes) from S to G if the straight line distance is given in the table below



a) Graph with actual cost

S	10
A	7
B	3
C	1
G	0

b) table with Straight line distance

04. Consider the following axioms Each (2 marks) **[10]**

a. Every boy or girl is a child

b. Every child gets a doll or a train or a lump of coal

c. No boy gets any doll

d. No child who is good gets any lump of coal

e. Jack is a boy

Construct a proof by refutation using resolution of the statement:

" If Jack doesn't get a train, then Jack is not a good boy "

05. Assume that we have a bag of three biased coins a, b and c with probabilities of coming up heads of 20% 60% and 80% respectively. One coin is drawn randomly from the bag and then the coin is flipped three times to generate the outcomes X_1 , X_2 and X_3 . **[10]**

i) Construct a Bayesian network and define the necessary conditional probability table for the above scenario. (5 marks)

ii) Find P(C|2 heads, 1 tail) (3 marks)

iii) Find P(X_1 = tails , X_2 = heads , X_3 = heads | C=a) (2 marks)

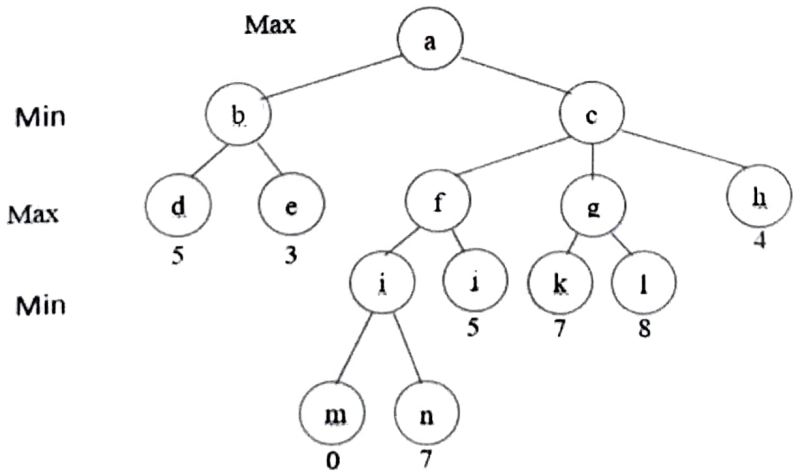
PART-B (2 X 15 Marks)

Answer all questions

06. Given the intermediate state of a 2 player game where Player 1 has to make his next move. **[15]**

i) Find which player wins the game by travelling the entire tree. Project the path travelled. (6 marks)

ii) Find which player wins the game by not visiting all the nodes. Project the path travelled. (9 marks)



07. You are starting a restaurant with a minimum investment to attract people who travel by 2-wheeler as your location does not have a car parking facility. Your restaurant is inside the city limits, where there are other bigger hotels as competitors for you. As an expert in the field of the **[15]**

hotel business, you reduce the cost of food products by 20%.

a) What will be your innovative thinking that can make your restaurant reach the highest sales within a minimum time period other than reducing the cost of food menus? (5 marks)

b) What will be the difficulty in developing this kind of expert system to run the hotel successfully? (10 marks)

PART-C (1 X 20 Marks)

Answer all questions

08. An educator wants to determine whether students exam scores were related to revision time. For example, as students spent more time in revising, did their exam score increase (a positive relationship) or did the opposite happen? The dependent variable "Exam Score", is measured on a scale from 0 to 100, and the independent variable "Revision Time", is measured in hours. [20]

Sl.No	Exam Score	Revision Time
1	94	80
2	88	60
3	71	56
4	75	47
5	71	43

Given the dataset of 5 students

a) Check if there are possibilities of applying any kind of regression for the above situation. If yes, what technique needs to be applied ? Justify your answer with a plot and also test on a new value of your choice.(10 marks)

b) Add attributes and corresponding values needed to create a new dataset. Apply any clustering algorithm for the new dataset and discuss the results for the newly created dataset. Justify the technique applied and need for adding the new parameters (10 marks)

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