End Term (Even) Semester Examination May-June 2025

Roll no.....

Name of the Program and semester: B.Tech. (CSE), IV
Name of the Course: Fundamental of Statistics and AI
Course Code: TCS 421

Time: 3 hours Maximum Marks: 100

Note:

(i) All the questions are compulsory.
(ii) Answer any two sub questions from a, b and c in each main question.
(iii) Total marks for each question is 20 (twenty).
(iv) Each sub-question carries 10 marks.

Q1. (2X10=20 Marks)

a. Introduce Search techniques in AI that are Brute Force, Greedy and Heuristic. **CO2**

b. Define and give examples of Intelligent Agents in AI, give 2 applications for each Agent. **CO3**

c. Give Four different ways of defining AI. With block diagram outline typical AI Engine. **CO2**

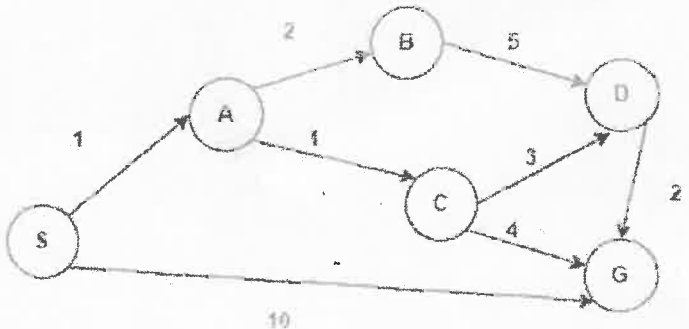
Q2. (2X10=20 Marks)

a. Explain and Describe the Types of AI in detail, giving an example for each type. **CO4**

b. Explain the functions in PEAS description, give real-world example that explains these functions. **CO3**

c. Apply A* for the given graph to search the goal node. Consider Start Node = S and Goal Node = G, Table below gives the heuristic w.r.t goal node.

S	A	B	C	D	G
6	7	8	4	6	0



CO4

Q3. (2X10=20 Marks)

a. Discuss Turing Test and give two real-world applications. **CO2**

b. Explain big data using the 5 V's **AND** Outline the big data architecture with Hadoop. **CO4**

c. Explain what Data Science means **AND** describe the role of Data Scientist. **CO5**

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Q4.

a. Define the following with 1 example for each term: (i) Correlation, (ii) Random variable, (iii) Variance, (iv) Sample Mean **CO3**

b. Showcasing real-world example like online Product reviews for e-commerce providers like Amazon or Flipkart; justify Big data and back-end analytics. Also, explain the role of 5 V's in Big data. **CO4**

c. Illustrate the properties of Probability mass function, Cummulative Distribution Function and Probability density Function. Give two examples for each of these statistical functions. **CO2**

(2X10=20 Marks)

Q5.

a. A fair coin is tossed 10 times, compute showing steps Probab. (atleast 5 heads), Probab.(atmost 3 tails) And, state Bayes Theorem **CO3**

b. Describe the following: (a) Bernoulli Random variable. (b) Outlier. (c) A star heuristic, (d) AI as Problem solving **CO4**

c. Given the following data points depicting weight = W and length = L for Salmon obtain linear Regression model of L in terms of W. **CO3**

L	10	12	16	18	19	21	25
W	22	44	49	52	59	42	51