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PRN: 1032210755

Term End Examination

Dec 2023

CET2007B - Artificial Intelligence and Expert System

Question Paper ID: 027175

Faculty/School	Engineering and Technology	Term	Semester V
Program	TY B.Tech CSE	Duration	2 Hours 30 Minutes
Specialization		Max. Marks	70

Section - 1 (7 X 10 Marks)
Answer any 7 questions

1	a. How would you leverage AI in financial forecasting to enhance accuracy and efficiency? Discuss two types of AI techniques/Algorithms employed in financial forecasting. b. What is an Artificial Neural Network? Explain its resemblance with biological neural networks. Support the explanation with a neat and labeled diagram.	10 marks 3	CO5	Understanding
2	a. In a bolt factory, three machines M_1, M_2, and M_3 manufacture 2000, 2500, and 4000 bolts every day. Of their output 3%, 4%, and 2.5% are defective bolts. One of the bolts is drawn very randomly from a day's production and is found to be defective. What is the probability that it was produced by machine M_2? b. What do you understand about Probabilistic Reasoning? Explain its need with an example.	10 marks	CO2, CO3	Evaluating
3	a. Draw a neat architecture for Expert System and also explain all basic components of an Expert System. b. List out 10 important characteristics of expert systems.	10 marks 9	CO4	Remembering
4	a. Explain the process of constructing a Bayesian Network. Discuss the significance of the graphical structure and the concept of conditional probability in Bayesian Network b. Develop a Fuzzy logic system based on Air Conditioner with clear explanation of all steps involved.	10 marks	CO3, CO4	Understanding

5	a) Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1 : 2 : 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C. b. How is Bayes' Rule applied in probability theory, and what is its practical use in real-world scenarios?	10 marks	CO3	Evaluating
6	a. Derive 3 different heuristic functions to solve 8 puzzle problem and Explain admissibility property of A* algorithm in detail. b. Explain the Minimax Algorithm with Alpha-beta pruning for the game of Chess	10 marks	CO1, CO2	Analysing
7	1. A given "situation" ("state") can be described using a formula made up of the following predicates 1. ON(A, B):block A is on block B 2. ONTABLE(A):block A is on the table 3. CLEAR(A):there is nothing on top of block A 4. HOLDING(A):the robot arm is holding block A 5. ARMEMPTY:the robot arm is holding nothing a) Write preconditions, add, and delete for following four actions a.1) UNSTACK (x,y) a.2) STACK (x,y) a.3) PICKUP (x) a.4) PUTDOWN(x) b. Provide insights into five various techniques for expressing knowledge.	10 marks	CO2	Applying
8	a. Draw neat and labeled architecture of MYCIN and explain each component. b. How to fetch knowledge from domain experts to design expert systems.	10 marks	CO4	Understanding
9	a. Present a diagrammatic explanation of Hierarchical Planning. b. Clarify the procedures of Forward and Backward Chaining using a graphical representation and a relevant example.	10 marks	CO1, CO2	Applying
10	a. Explain the fundamental concept of a Convolutional Neural Network (CNN) and its significance in image processing. b. Provide the key differences between supervised learning and unsupervised learning in the context of machine learning.	10 marks	CO5	Applying

END OF THE QUESTION PAPER