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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Computer Science and Engineering
Semester End Examination; Feb. - 2021
Artificial Intelligence

Time: 3 hrs   *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Define Artificial intelligence and identify problems for AI. Characterize the search techniques to solve problems and recognize the scope of classical search techniques.

CO2: Define knowledge and its role in AI. Demonstrate the use of Logic in solving AI problems.

CO3: Demonstrate handling of uncertain knowledge and reasoning in probability theory.

CO4: Explain Learning methods in AI.

CO5: Explain Knowledge Learning, probabilistic models and reinforcement learning in AI.

Note: **I) PART - A** *is compulsory.* **Two** *marks for each question.*

II) PART - B: *Answer any* **Two** *sub questions (from a, b, c) for Maximum of* **18 marks** *from each unit.*

Q. No.	Questions	Marks	BLs	COs	POs
	I : PART - A	**10**			
I a.	Define rational agent.	2	L1	CO1	PO2
b.	Formulate existential quantification (∃) for the following sentence "King john has a crown on his Head".	2	L6	CO2	PO3
c.	Discover Baye's theorem.	2	L4	CO3	PO2
d.	Construct, the entropy of a random variable V with values V_k, each with probability $P(V_k)$?	2	L3	CO4	PO9
e.	List variety of learning techniques.	2	L1	CO5	PO1
	II : PART - B	**90**			
	UNIT - I	**18**			
1 a.	Discover in detail, what artificial intelligence can do today in terms of applications.	6	L2	CO1	PO1
b.	List four basic kinds of agent programs, explain with neat diagram.	12	L3	CO1	PO1
c.	List Informed (Heuristic) search strategies. What is alpha-beta pruning? Construct Alpha-beta search algorithm.	12	L1	CO1	PO3
	UNIT - II	**18**			
2 a.	What is knowledge based agent? Illustrate the outline of a knowledge based agent program.	9	L1	CO2	PO2
b.	Explain quantifiers with all notations and example.	9	L5	CO2	PO1
c.	Distinguish between forward chaining and backward chaining give example.	9	L4	CO2	PO10

UNIT - III   18

3 a. Define the following:

  i) Uncertainly

  ii) Product rule   6   L1   CO3   PO2

  iii) Bayesian networks

b. Estimate *P(cavity / toothache)*, *P(cavity)*, *P(cavity / toothache)* and *P(¬ cavity/toothache)* from the given Table 3.

	Toothache		¬Toothache	
	Catch	¬Catch	Catch	¬Catch
Cavity	0.108	0.012	0.072	0.008
¬Cavity	0.016	0.064	0.144	0.576

12   L6   CO3   PO4

Table 3. A full joint distribution for the toothache, cavity and catch world.

c. Explain Hidden Markov models with location example and semantics of Bayesian network.   12   L5   CO3   PO2

UNIT - IV   18

4 a. Create a decision tree for deciding whether to wait for a table at a restaurant.   9   L6   CO4   PO3

b. Compare univariate linear regression and multivariate linear regression.   9   L4   CO4   PO2

c. Explain single-layer feed-forward neural networks and multilayer feed-forward neural networks.   9   L5   CO4   PO2

UNIT - V   18

5 a. Construct an algorithm for finding a minimal consistent determination.   9   L3   CO5   PO4

b. Explain unsupervised clustering with example.   9   L5   CO5   PO12

c. List the approaches how utilities can be learning explain in detail.   9   L1   CO5   PO1

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