Sub Code:NBC504

Paper Id: 910162 Roll No: | | | | | | | | | | | | | |

**MCA (DUAL DEGREE)**
**(SEM-V) THEORY EXAMINATION 2019-20**
**ARTIFICIAL INTELLIGENCE**

***Time: 3 Hours*** ***Total Marks: 100***

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt *all* questions in brief. 2 x 10 = 20**

| | |
|---|---|
| a. | How goal-based agent works? |
| b. | Define the Heuristic function with example. |
| c. | What do you mean by alpha-beta pruning? Explain in brief. |
| d. | Differentiate between human vision and computer vision. |
| e. | Define the term production system. |
| f. | Briefly explain forward chaining with example. |
| g. | What do you mean by state space representation of a problem? |
| h. | With the help of a diagram, explain the functioning of a classifier. |
| i. | What do you understand by the term probabilistic reasoning? |
| j. | Write a short note on nearest neighbor rule. |

**SECTION B**

**2. Attempt any *three* of the following: 10x3=30**

| | |
|---|---|
| a. | What are the different categories of AI tasks? Explain. |
| b. | Explain the concept of Simulated Annealing. Also write its algorithm. |
| c. | Discuss algorithm to convert predicate formula to clause form with proper example. |
| d. | Describe Expectation Maximization algorithm for learning with hidden data. |
| e. | Explain the concept of Principle Component Analysis with the help of suitable diagram. |

**SECTION C**

**3. Attempt any *one* part of the following: 10x1=10**

| | |
|---|---|
| a. | What is an intelligent agent? Discuss the structure of an intelligent agent with the help of a diagram. Also explain the functioning of utility-based intelligent agent. |
| b. | Describe various foundation areas of Artificial Intelligence. |

**4. Attempt any *one* part of the following: 10x1=10**

| | |
|---|---|
| a. | What do you mean by hill climbing? Explain different types of hill-climbing searching methods. |
| b. | Discuss and compare Depth-first search and Breadth-search methods with proper diagram. |

**5. Attempt any *one* part of the following: 10x1=10**

| | |
|---|---|
| a. | What do you mean by Bayesian network? Discuss steps to construct a Bayesian network. |
| b. | Convert the following into clause form-<br>**(i) black →~white**<br>**(ii) white → ~black ∧ ~yellow ∧ ~red**<br>**(iii) snow → white**<br>**(iv) black → coal ∨ dark**<br>(v) **white → bright** |

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**6. Attempt any *one* part of the following: 10x1=10**

| | |
|---|---|
| a. | What is the difference between human learning and machine learning process? Discuss. Also differentiate between supervised and unsupervised learning. |
| b. | Explain the functioning of decision tree for classification using a suitable diagram. Also state limitations of decision tree. |

**7. Attempt any *one* part of the following: 10x1=10**

| | |
|---|---|
| a. | What do you mean by statistical pattern recognition? Explain any one statistical pattern recognition model with proper diagram. |
| b. | Discuss and compare different types of support vector machine. |

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