*Total No. of Questions: 6* *Total No. of Printed Pages:3*

**Enrollment No.....**

# Faculty of Engineering
## End Sem Examination Dec 2024
## RA3EL07 Artificial Intelligence

Programme: B.Tech. Branch/Specialisation: RA

**Duration: 3 Hrs.** **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

| | | | Marks | BL | PO | CO | PSO |
|---|---|---|---|---|---|---|---|
| Q.1 | i. | Which of the following is a component of artificial intelligence?<br>(a) Designing (b) Training<br>(c) Learning (d) Puzzling | **1** | 1 | 1 | 1 | 1 |
| | ii. | The correct ways to solve a problem of state-space search are-<br>(a) Forward from the initial state<br>(b) Backward from the goal<br>(c) Forward from the initial state and backward from the goal<br>(d) None of these | **1** | 1 | 1 | 1 | 1 |
| | iii. | "In AI systems, knowledge can be represented in two ways. What are these two ways?<br>I. Machine logic<br>II. Predicate logic<br>III. Propositional logic<br>IV. Compound logic<br>(a) I and II (b) I and III<br>(c) II and III (d) III and IV | **1** | 1 | 2 | 1,2 | 1 |
| | iv. | Which is not a property of representation of knowledge?<br>(a) Representational verification<br>(b) Representational adequacy<br>(c) Inferential adequacy<br>(d) Inferential efficiency | **1** | 1 | 2 | 1 | 1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| v. | Where does the dependance of experience is reflected in prior probability sentences?<br>(a) Syntactic distinction<br>(b) Semantic distinction<br>(c) Both (a) and (b)<br>(d) None of these | **1** | 1 | 3 | 1 | 1 |
| vi. | How many terms are required for building a bayes model?<br>(a) 1 (b) 2 (c) 3 (d) 4 | **1** | 1 | 3 | 1 | 1 |
| vii. | Which of the following includes major tasks of NLP?<br>(a) Automatic summarization<br>(b) Discourse analysis<br>(c) Machine translation<br>(d) All of these | **1** | 1 | 4 | 1 | 1 |
| viii. | What is state space?<br>(a) The whole problem<br>(b) Your definition to a problem<br>(c) Problem you design<br>(d) Representing your problem with variable and parameter | **1** | 1 | 4 | 1 | 1 |
| ix. | Which is true for neural networks?<br>(a) It has set of nodes and connections<br>(b) Each node computes it's weighted input<br>(c) Node could be in excited state or non-excited state<br>(d) All of these | **1** | 1 | 5 | 1 | 1 |
| x. | Which of the following are components of expert systems?<br>(a) Knowledge base (b) Inference engine<br>(c) User interface (d) All of these | **1** | 1 | 5 | 1 | 1 |
| Q.2 | Attempt any two: | | | | | |
| i. | Define artificial intelligence and write its advantages and disadvantages. | **5** | 2 | 1 | 1 | 1 |
| ii. | Explain the A* (A star) algorithm with suitable example. | **5** | 2 | 1 | 1 | 1 |



| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | iii. | Write the difference between breadth first search and depth first search. | **5** | 4 | 1 | 1 | 1 |
| Q.3 | i. | What is knowledge representation? Explain the types of knowledge. | **4** | 2 | 2 | 1 | 1 |
| | ii. | Differentiate between propositional logic and first-order predicate logic. | **6** | 4 | 2 | 1 | 1 |
| OR | iii. | Write short notes:<br>(a) Refutation in AI<br>(b) Inferencing in AI | **6** | 2 | 2 | 1 | 1 |
| Q.4 | i. | Differentiate between forward and backward referencing. | **4** | 4 | 3 | 1 | 1 |
| | ii. | Write a script for "Going to waterpark for friend's birthday party". | **6** | 4 | 3 | 1 | 1 |
| OR | iii. | Write short notes:<br>(a) Frame (b) Semantic network | **6** | 2 | 3 | 1 | 1 |
| Q.5 | i. | Explain natural language processing and write its applications. | **4** | 2 | 4 | 1 | 1 |
| | ii. | Explain briefly the some of the refinement techniques used in minimax search procedure. | **6** | 2 | 4 | 1 | 1 |
| OR | iii. | Explain the block world problem in robotics. | **6** | 2 | 4 | 1 | 1 |
| Q.6 | | Attempt any two: | | | | | |
| | i. | Write the comparison between artificial neural network and biological neural network. | **5** | 4 | 5 | 1 | 1 |
| | ii. | Write various techniques used in learning. Explain anyone of them. | **5** | 2 | 5 | 1 | 1 |
| | iii. | Write various applications of neural networks. | **5** | 3 | 5 | 1 | 1 |

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## Marking Scheme
## RA3EL07 Artificial Intelligence

| | | | |
|---|---|---|---|
| Q.1 | i. | (c) Learning | **1** |
| | ii. | (a) Forward from the initial state | **1** |
| | iii. | (c) II and III | **1** |
| | iv. | (a) Representational verification | **1** |
| | v. | (b) Semantic distinction | **1** |
| | vi. | How many terms are required for building a bayes model?<br>(c) 3 (d) 4 | **1** |
| | vii. | (d) All of these | **1** |
| | viii. | (d) Representing your problem with variable and parameter | **1** |
| | ix. | (d) All of these | **1** |
| | x. | (d) All of these | **1** |
| | | | |
| | | Attempt any two: | |
| Q.2 | i. | Definition 1 mark<br>advantages 2 mark<br>disadvantages. 2 mark | **5** |
| | ii. | Diagram 1 mark<br>Equation 1 mark<br>Explain 3 mark | **5** |
| | iii. | At least 5 difference 5 mark | **5** |
| Q.3 | i. | Definition 1 mark<br>types of knowledge. 3 mark | 4 |
| | ii. | Minimum 4 difference 1.5x4 = 6 marks | **6** |
| OR | iii. | Each note: 3 marks<br>(a) Refutation in AI<br>(b) Inferencing in AI | **6** |
| | | | |
| Q.4 | i. | Minimum 4 difference 4 marks | 4 |
| | ii. | Script 6 marks | **6** |
| OR | iii. | Each short note: 6 marks | **6** |
| | | | |
| Q.5 | i. | Natural language processing 2 marks<br>applications. 2 marks | 4 |
| | ii. | α-β pruning 4 marks<br>Diagram 2 marks | 6 |
| OR | iii. | Rule 2 marks<br>Code 2 marks<br>Diagram/ Explanation 2 marks | 6 |
| | | | |
| | | Attempt any two: | |
| Q.6 | i | Minimum 5 Difference artificial neural network and biological neural network. 5 marks | **5** |
| | ii | Techniques 2 marks<br>Explanation 3 marks | **5** |
| | iii | Minimum 5 applications 5 marks | **5** |

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