S.No. : 127   BAI 3101

No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33701   Roll No.

B. Tech. Examination 2021-22

(Special Carry Over Paper)

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

Time : Three Hours]   *[Maximum Marks : 60*

Note :— (i)   Attempt all questions.

(ii)   All questions carry equal marks.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

    (a)   What is artificial intelligence? Define.

    (b)   Define intelligent agent.

    (c)   What is soft computing? Define.

    (d)   What is membership function is a fuzzy set?

    (e)   Define nature inspired computing.

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(f) What is artificial neural network?

(g) Write down five applications of artificial intelligence in healthcare sector.

(h) What is activation function in an artificial neural network?

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

(a) Two fuzzy sets A and B are given below :

$$A = \left\{ \frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\}$$

$$B = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}$$

     (i) Calculate complement of A and B.

     (ii) Calculate union of fuzzy sets A and B.

     (iii) Calculate intersection of fuzzy sets A and B.

(b) Draw the block diagram of artificial neural network. Explain its all components.

(c) Write a note on the historical development of the artificial intelligence. Also explain different types of AI.

(d)   Explain alpha-beta pruning with suitable example.

SECTION – C

Note :–   Attempt all questions. Attempt any two parts from each question. $8 \times 5 = 40$

3.   (a)   Explain the following terms in a search algorithm :

        (i)   Search space

        (ii)   Start state

        (iii)   Coal state

        (iv)   Search tree

    (b)   Explain informed search and blind search algorithms.

    (c)   Write down best first search algorithm. Explain.

4.   (a)   Explain A* search algorithm in detail.

    (b)   Write down the concepts of adversarial search. Define game tree.

    (c)   What are local and global search algorithms for the optimization problems? Explain.

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5. (a) What is knowledge representation? Explain various types of knowledge.

   (b) Explain the concept of first order logic for the representation of knowledge.

   (c) Explain the following :

   (i) Forward and backward chaining

   (ii) Bayesian network

6. (a) Explain the ethical issues while application of artificial intelligence in human life.

   (b) Write down a note on the application of AI in the area of data security, social media and agriculture.

   (c) What is probabilistic reasoning? Explain.

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