2021

COMPUTER SCIENCE — HONOURS

Paper : DSE-B-3

(Introduction to Computational Intelligence)

Full Marks : 50

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer ***question no.*** **1** and ***any four*** from the rest.

1. Answer ***any five*** questions : 2×5

(a) What do you understand by state space search?

(b) Differentiate data driven search and goal driven search.

(c) Define fuzzy set.

(d) Discuss any two characteristics of Prolog.

(e) What is Heuristic function?

(f) What do you mean by Semantic Net?

(g) Distinguish between Machine learning and Deep learning.

(h) Discuss in brief about fuzzy relationship.

2. (a) Discuss with an example about the Depth First Search algorithm.

(b) Discuss about the time complexity of Depth First Search. (4+4)+2

3. Write short notes on (***any two***) : 5×2

(a) Gradient Descent Method

(b) Feed forward neural network

(c) De-fuzzification

(d) Training dataset.

4. (a) Differentiate between probabilistic approach and fuzzy logic based approach.

(b) What is the sequence of steps taken in designing a fuzzy logic machine? 5+5

5. (a) What do you understand by Game playing in Artificial Intelligence?

(b) Explain Minimax search algorithm for game playing. 3+7

Please Turn Over

6. (a) Differentiate fuzzy set and crisp set.

(b) Prove that $\left(\tilde{A} \cap \tilde{B}\right)^c = \tilde{A}^c \cup \tilde{B}^c$

where, $\tilde{A} = \{(x_1, 0.4), (x_2, 0.3)\}$

and $\tilde{B} = \{(x_1, 0.2), (x_2, 0.6)\}$

and $\tilde{A}$ and $\tilde{B}$ are fuzzy set. 5+5

7. $\tilde{A}$ and $\tilde{B}$ are two fuzzy sets.

$\mu_{\tilde{A}}(x) = \frac{x}{x+1}$ and $\mu_{\tilde{B}}(x) = \frac{1}{x}$

Find membership function of each of the following :

(a) $\tilde{A}^c$ *and* $\tilde{B}^c$

(b) $\tilde{A} \cup \tilde{B}$

(c) $\tilde{A} \cap \tilde{B}$

(d) $\left(\tilde{A} \cup \tilde{B}\right)^c$

(e) $\left(\tilde{A} \cap \tilde{B}\right)^c$ 2×5

8. (a) Discuss with an example about A^* algorithm.

(b) Is iterative deeping search complete?— Justify your answer. 7+3

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