2016

M.Sc.

3rd SEMESTER EXAMINATION

COMPUTER SCIENCE

PAPER—COS-302

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

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

Illustrate the answers wherever necessary.

Module-I

(*Artificial Intelligence*)

[Marks : 25]

Answer any *two* questions.

1. A farmer with his wolf, goat and cabbage arrives at the bank A of the river they wish to cross. There is a boat at the bank A of river, which the farmer only can row. The boat can carry only two things including rows at a time. If the wolf is even left with the goat, the wolf will eat the goat. Also if the goat is left alone with cabbage the goat will eat the cabbage.

(a) Formulate the problem as state space search problem.

(b) Draw the implicit search graph.

(c) Solve the problem.

4+3+3

2. (i) Prove the following equivalence using truth table :

$\sim(P \wedge Q) \equiv \sim P \vee \sim Q$

$P \leftrightarrow Q \equiv (P \rightarrow Q) \wedge (Q \rightarrow P)$

(ii) Define Existential Quantifies and Universal Quantifies with example.

(iii) What is hill-climbing method ?

$(2+3)+(1\frac{1}{2}+1\frac{1}{2})+2$

3. Compare and contrast BFS and DFS. Explain the technique to overcome the drawbacks of both. 5+5

4. Write short notes on : 5+5

(i) Depth limited search ;

(ii) Simulated Annealing.

[*Internal Assessment — 5 Marks*]

Module-II

(*Soft. Computing*)

[Marks : 25]

Answer *any two* questions.

1. (a) What is a Soft computing ? How it differs from other traditional algorithms ?

(b) Why probability of crossover (pc) is generally kept higher than probability of mutation (pm) in Genetic Algorithm ?

(2+3)+5

2. (a) How fuzzy set concept differs from crisp set ?

(b) Briefly explain any two defuzzification method.

4+6

3. (a) State the differences between single point crossover and uniform crossover.

(b) What is a Generalized Modes Ponens and Generalized Modes Tollens ?

(c) Let $P = \begin{bmatrix} 0.3 & 0.5 & 0.8 \\ 0.0 & 0.7 & 1.0 \\ 0.4 & 0.6 & 0.5 \end{bmatrix}$, $Q = \begin{bmatrix} 0.9 & 0.5 & 0.7 & 0.7 \\ 0.3 & 0.2 & 0.0 & 0.9 \\ 1.0 & 0.0 & 0.5 & 0.5 \end{bmatrix}$.

Find P.Q .

4+3+3

4. (a) What is Delta learning role ? How is this applied in Artificial neural network ?

   (b) Briefly explain the pseudocode of a Genetic Algorithm with an example.

(3+2)+5

[*Internal Assessment — 5 Marks*]