[150/A39] SEAT No. _____ *No. of printed pages: 2*

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SARDAR PATEL UNIVERSITY

M.C.A Master of Computer Applications

Semester –V External Examinations, October 2018

PS05CMCA01 – Artificial Intelligence

Time: 2:00 p.m to 05:00 p.m. **Tuesday, 23rd October, 2018** **Max Marks: 70**

Q1. Choose the most appropriate option for each question. **[8]**

i. _____ test determines whether the given program is intelligent or not.
   A) Covering B) Turing
   C) Partioning D) Fuzzy

ii. _____ approach is also called as goal directed/driven approach.
   A) Forward chaining B) Backward chaining
   C) BFS D) All of these

iii. The rule ~P=>~Q and Q is true, then P is true is _____.
   A) Modus Ponens B) Modus Tollens
   C) Chain Rule D) None of these

iv. Quantifiers are not present in _____ logic.
   A) Predicate B) Proposition
   C) Both A and B D) None of these

v. _____ is an artificial neural network model that uses parallel relaxation.
   A) Perceptron model B) Kohonen model
   C) Hopfield model D) All of these

vi. The principle of genetic algorithm is based on _____.
   A) Natural evolution B) Fine logic
   C) Statistics D) Binary logic

vii. _____ is the characteristic of an agent.
   A) Pro-activeness B) Co-operation
   C) Autonomy D) All of these

viii. _____ method of leaning in ANN requires datasets.
   A) supervised B) Unsupervised
   C) Parallel D) None of these

Q2. Answer the following questions (Any Seven): **[14]**

a. Differentiate between CBIS and KBS.
b. Write only algorithm for generate – and – test method.
c. Define fuzzy set and give one example of fuzzy set.
d. List any four components of predicate logic.
e. Give any two activation functions of ANN.
f. Define knowledge management process. Also list its advantages.
g. Explain (i) mutation and (ii) crossover in binary encoding in GA.
h. Define soft computing. Also list constituents of soft computing.
i. List any two applications of AI that make the Web intelligent.

(P.T.O.)

Q3. Answer the following questions:

a. Define AI. List the domain areas of AI. Discuss advantages and disadvantages of AI. [6]

b. Explain hill climbing search method by giving its algorithm and its variation in detail. [6]

b. Draw the general structure of KBS. Also list and explain any one category of KBS in detail. [6]

Q4. Answer the following questions:

a. Write a detailed note on fuzzy rule based system. [6]

b. For Fuzzy sets $\tilde{A} = \{(x1,0.3),(x2,0),(x3,0.7)\}$ *and* $\tilde{B} = \{(x1,0.6),(x2,1),(x3,0.7)\}$ Find [6]

(1) $\tilde{A} \oplus \tilde{B}^c$

(2) $(\tilde{A} \oplus \tilde{B}) \cap \tilde{B}$

OR

b. Define fuzzy prepositions and discuss fuzzy connectives with their use in detail by taking suitable examples. [6]

Q5. Answer the following questions:

a. Draw biological neuron and an artificial neuron. Also explain how an artificial neuron is working. [6]

b. Explain in detail how a perceptron solves a linearly separable problem. [6]

OR

b. Design a neural network to select a course based on following data. [6]

	X1	X2	X3	X4	X5	O1	O2	O3
Sr. No.	Job Prospects	Personal Interest	Successes History	Available Resources	Availability of Teacher	Elective 1	Elective 2	Elective 3
1	Very high	Good	Acceptable	Acceptable	Good	1	0	0
2	Very high	Less	Good	Good	Acceptable	0	1	0
..	...	...	...	...	...	..	..	...

Q6. Answer the following questions:

a. Define mobile agent. Explain working of a typical mobile agent by giving its diagram. [6]

b. Minimize f(x) = x +2; where x belongs to [1, 31] with help of genetic algorithms. [6]
Take the initial population as {11011, 01101, 10011}.
What is the value of x that optimizes the function?
What is the minimum function value?

OR

b. Draw outline of typical genetic algorithm cycle. Also explain its working in detail. [6]

—X—