Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2013

Subject code: 730702 Date: 28-11-2013

Subject Name: Application of Artificial Intelligence to Power Systems

Time: 10.30 am – 01.00 pm Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Define Artificial Intelligence. Give comparison of different intelligent systems based on their applications (8)

(b) What is heuristic? Explain the difference between heuristic and algorithm (6)

Q.2 (a) Differentiate between fuzzy and crisp logic. Discuss the following properties of fuzzy sets (i) Cardinality (ii) Height (iii) Convexity (7)

(b) What are Artificial Neural Networks ? Describe the different types of activation functions used by artificial neurons. (7)

OR

(b) How do Genetic Algorithms differ from other search procedures? (7)

Q.3 (a) Consider two fuzzy numbers A = 4 and B = 6 defined as (7)

A = 0.3/2 + 0.7/3 + 1.0/4 + 0.7/5 + 0.3/6 + 0/7

B = 0.2/4 + 0.6/5 + 1.0/6 + 0.6/7 + 0.2/8 + 0/9

Carry out their addition and find the resultant fuzzy number using extension principle method

(b) With reference to fuzzy logic explain GMP and GMT. Support your answer with the help of a suitable example (7)

OR

Q.3 (a) Explain back propagation algorithm for training multiple layer neural network (10)

(b) Match the following (4)

1) Soma	W) Output
2) Dendrite	X) Neuron
3) Axon	Y) Weight
4) Synapse	Z) Input

Q.4 (a) Discuss the important features of Artificial Neural Networks (7)

(b) State and explain the different types of learning methods employed for neural networks. (7)

OR

Q.4 (a) With the help of flowchart explain the procedure of genetic algorithms (8)

(b) What is a schema? What is the relationship between schema and chromosome? What are the effects caused by crossover and mutation over instances of schema? (6)

Q.5 (a) Discuss the following selection methods with reference to GA (7)

(i) Roulette wheel selection (ii)Rank selection (iii) Tournament selection

(b) Explain how neural networks can be used for load forecasting (7)

OR

Q.5 (a) Explain how AI can be used power system state security assessment (7)

(b) Discuss economic generation scheduling using genetic algorithms. How would the fitness function be defined? (7)

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