Total No. of Questions : 4]

SEAT No. :

PB-203

[Total No. of Pages : 2

[6269]-422

T.E. (Robotics and Automation) (Insem.)

ARTIFICIAL INTELLIGENCE FOR ROBOTICS

(2019 Pattern) (Semester - II) (311509 A)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of calculator is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) What are features of uninformed search algorithms? Explain with suitable example any one uninformed search algorithm. **[8]**

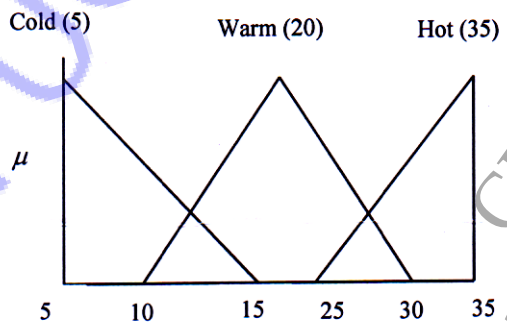
b) In genetic algorithm, the variable x_1 is coded 1101 and variable x_2 is coded 1001. Determine the value of objective function $x_1^2 - 10x_2$ if $-4 \leq x_1, x_2 \leq 3$. **[7]**

OR

Q2) a) What is Hidden Markov Model? What are its components? **[8]**

b) Demonstrate with suitable example application of Bayesian networks in robotics and automation? **[7]**

Q3) a) For the figure shown below, determine the membership values for temperature = 29° C. **[7]**



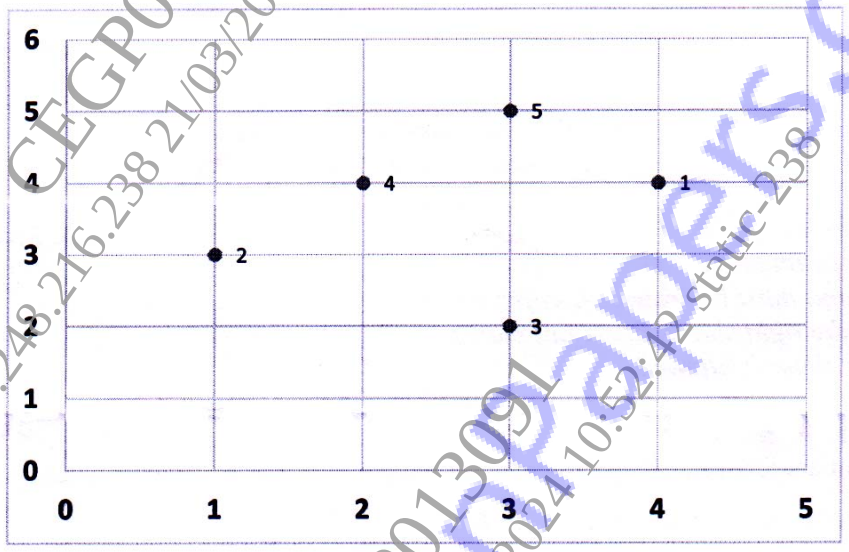
P.T.O.

b) For the following data, use linear regression to determine the equation of the best fit line. **[8]**

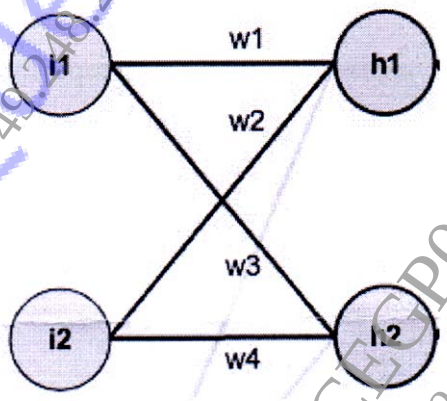
x	3	2	1	4	6
y	5	4	4	7	6

OR

Q4) a) Use K-Means Algorithm to create two clusters considering point 1 and 2 as initial centres. Perform two iterations. **[8]**



b) In a feed forward network the connections between input and hidden nodes as shown below. If $w_1 = 0.20$, $w_2 = 0.10$, $w_3 = 0.12$ and $w_4 = 0.26$, bias = 0.25. Determine net input to h_1 and net output of h_1 if input 1 (i_1) = 0.4 and input 2 (i_2) = 0.2. Use sigmoid activation function. **[7]**



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