Examination:	May-June 2017	**Date:**	15-5-17
Branch:	Computer Engineering	**Subject:**	DSP
Class/SEM:	BE/VII	**Paper Code:**	622701

Examination:	May-June 2017	**Date:**	25-5-17
Branch:	Computer Engineering	**Subject:**	AI
Class/SEM:	BE/VII	**Paper Code:**	811600

Examination:	May-June 2017	**Date:**	1/6/2017
Branch:	Computer Engineering	**Subject:**	MC
Class/SEM:	BE/VII	**Paper Code:**	621800

Examination:	May-June 2017	**Date:**	1/6/2017
Branch:	Computer Engineering	**Subject:**	SC
Class/SEM:	BE/VII	**Paper Code:**	790700

Examination:	May-June 2017	**Date:**	
Branch:	Computer Engineering	**Subject:**	CSS
Class/SEM:	BE/VII	**Paper Code:**	811500

Examination:	May-June 2017	**Date:**	
Branch:	Computer Engineering	**Subject:**	DSP
Class/SEM:	BE/VII	**Paper Code:**	621601

BE SEM-VII/CBGS/COMP/AI/25-5-16 May-16

Comp

Sub:- AI

QP Code : 31334

(3 Hours) [Total Marks : 80]

N. B. : (1) Each question carry 20 marks.
(2) Question 1 is compulsory.
(3) Attempt any three (3) from the remaining questions.
(4) Assume suitable data wherever required.

1. Attempt any four (4) questions from the following: 20
(a) Draw and explain architecture of Expert System.
(b) Explain Hill-climbing algorithm with an example.
(c) Give PEAS description for a Robot Soccer player. Characterize its environment.
(d) Explain Turing test designed for satisfactory operational definition of intelligence.
(e) Prove that A* is admissible if it uses a monotone heuristic.
(f) Compare and Contrast problem solving agent and planning agent.

2. (a) Explain decision tree learning with an example. What are decision rules? How to use it for classifying new samples? 10
(b) Write first order logic statements for following statements: 10
(i) If a perfect square is divisible by a prime p then it is also divisible by square of p.
(ii) Every perfect square is divisible by some prime.
(iii) Alice does not like Chemistry and History.
(iv) If it is Saturday and warm, then Sam is in the park.
(v) Anything anyone eats and is not killed by is food.

3. (a) Design a planning agent for a Blocks World problem. Assume suitable initial state and final state for the problem. 10
(b) Find the probabilistic inference by enumeration of entries in a full joint distribution table shown in figure 1. 10
(i) No cavity when toothache is there
(ii) p (Cavity! toothache or catch)

	toothache		¬toothache	
	catch	¬catch	catch	¬catch
cavity	.108	.012	.072	.008
¬cavity	.016	.064	.144	.576

Figure 1.

[TURN OVER

4. (a) Compare following informed searching algorithms based on performance measure with justification: Complete, Optimal, Time complexity and space complexity. 10
   a) Greedy best first
   b) A*
   c) Recursive best-first (RBFS)

   (b) Apply alpha-Beta pruning on example given in Figure 2 considering first node as max. 10

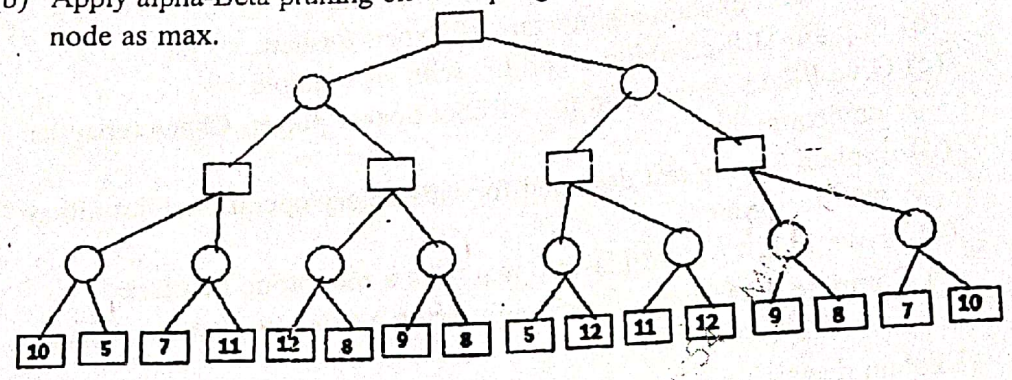


Figure 2.

5. (a) Explain how genetic algorithm can be used to solve a problem by taking a suitable example. 10

   (b) Consider the graph given in Figure 3 below. Assume that the initial state is A and the goal state is G Find a path from the initial state to the goal state using DFS. Also report the solution cost 10

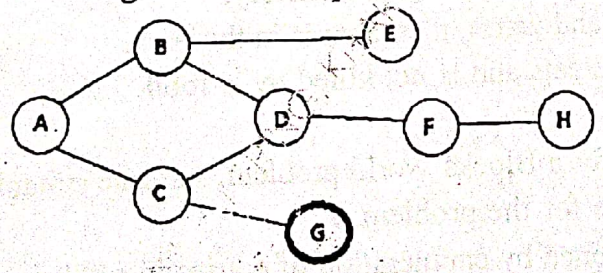


Figure 3.

6. (a) Explain the steps involved in converting the propositional logic statement into CNF with a suitable example 10

   (b) What are the basic building blocks of Learning Agent? Explain each of them with a neat block diagram. 10

B.E (Comp) Elective
Sem VII CBGS
Soft computing.

QP Code : 6000

(3 Hours) [Total Marks : 80

N.B. 1) Question No. 1 is compulsory
2) Attempt any three questions out of remaining 5 questions
3) Draw neat labeled diagram wherever necessary.

1 Solve any four : 20

A Define soft computing? Distinguish between soft computing and hard computing.

B Determine (alfa) α -level sets and strong α -level sets for the following fuzzy set.
A = {(1, 0.2), (2, 0.5), (3, 0,8), (4,1), (5, 0.7), (6, 0.3);

C Prove that the first order derivative of a unipolar continuous activation function is
f ' (net) =O (1-O)

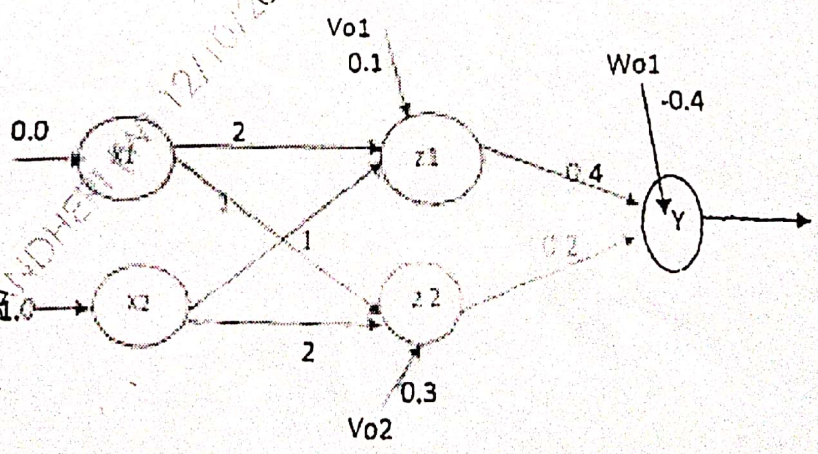
D Draw the five layer architecture of ANFIS and explain each layer in brief.

E What are the differences between derivative free and derivative based optimization.

F Distinguish between Supervised and Un-supervised learning

2 Design a fuzzy controller for a train approaching station. Inputs are speed and Distance and output is Break power. Use triangular membership function. Consider two descriptor for input and three descriptors for output. Derive a set of rules for control action and defuzzification. The design should be supported by figures wherever possible. Design a fuzzy controller for a train with high speed and small distance. 20

3 A Apply Backpropogation Algorithm to find the final weights for the following net. 10
Inputs: x = [0.0,1.0], Weights between Hidden and Output Layers : w = [0.4 ,0.2] ,Bias on the Output Node O is Wo= [-0.4], Weights between Input and Hidden Layer: v = [2,1 ;1,2], Bias on Hidden Unit nodes are Vo= [0.1 0.3], Desired output : d = 1.0 ,



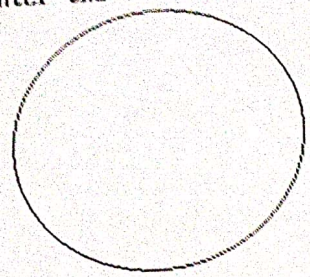
B What is self-organizing map? Draw and explain architecture of Kohonen Self Organization Feature Map KSOFM. 10

4 A What are the different types of encoding, selection, crossover, mutations of GA. Explain each type with suitable examples 10

B Explain with suitable examples Linearly and Non-linearly separable pattern classification 10

OUTPUT:

```
enter the radius50
```



5 A Explain Learning Vector Quantization Algorithm? 10

B The formation of algal solutions in surface water is strongly dependent on pH of water, temperature and oxygen content. T is a set of water temperatures from a lake given by T= {50, 55, 60} and O is oxygen content values in water given by O= {1, 2, 6}. The fuzzy set of T is given by {0.7/50+0.8/55+0.9/60} and fuzzy set of O is given by {0.1/1+0.6/2+0.8/6} 10

i. Find R=T x O for Given I={0.5/50 + 1/55+ 0.7/60}

ii. Find S=I o R using max-product composition

iii. Find S= I o R using max-min composition

6 Write short notes on any two: 20

A Steepest Descent algorithm

B Newton Method

C Fuzzy inference system

```
{
 y=y+1;
 e=e-2*dx;
}
x=x+1;
e=e+2*dy;
putpixel(x,y,15);
i=i+1;
}
while(i<=dx);
getch();
}
```

OUTPUT: