Time: 3 Hours **Marks: 80**

1) Q.1 is compulsory

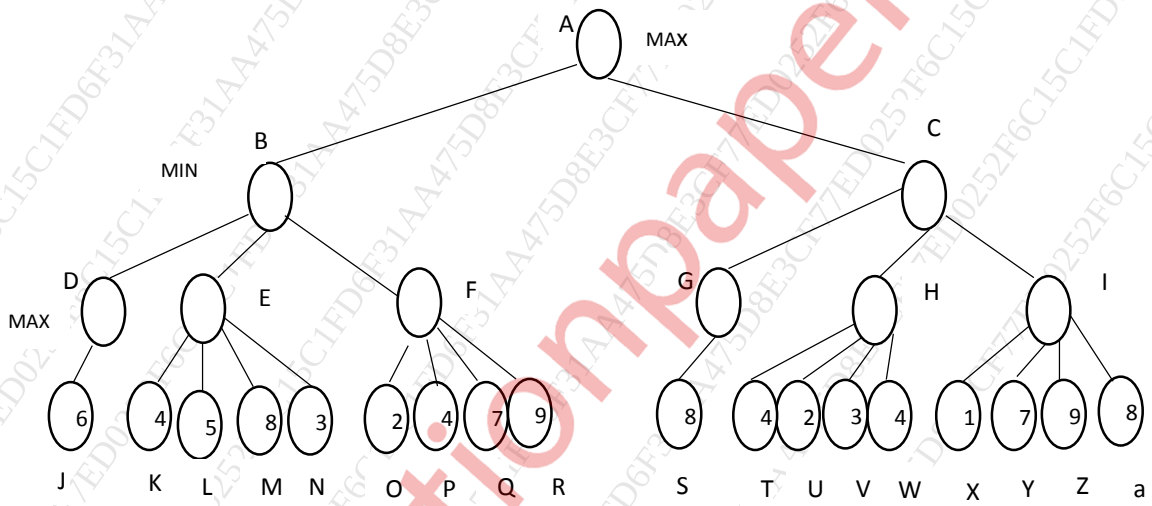
2) Attempt any **three** from remaining **five** questions

Q1) Solve any four of the following:

a) Describe different categories of AI [5]
b) Describe the characteristics of a medical diagnosis system using the PEAS properties [5]
c) Explain Goal based Agent with a block diagram [5]
d) Compare and contrast propositional logic and first order logic [5]
e) What do you mean by hill climbing. Explain. [5]

Q2)

a) Perform α - β pruning on the following graph, clearly indicating the α and β cuts and the final value of root node. [10]



b) What do you understand by informed and uninformed search methods? Explain in detail with example. [10]

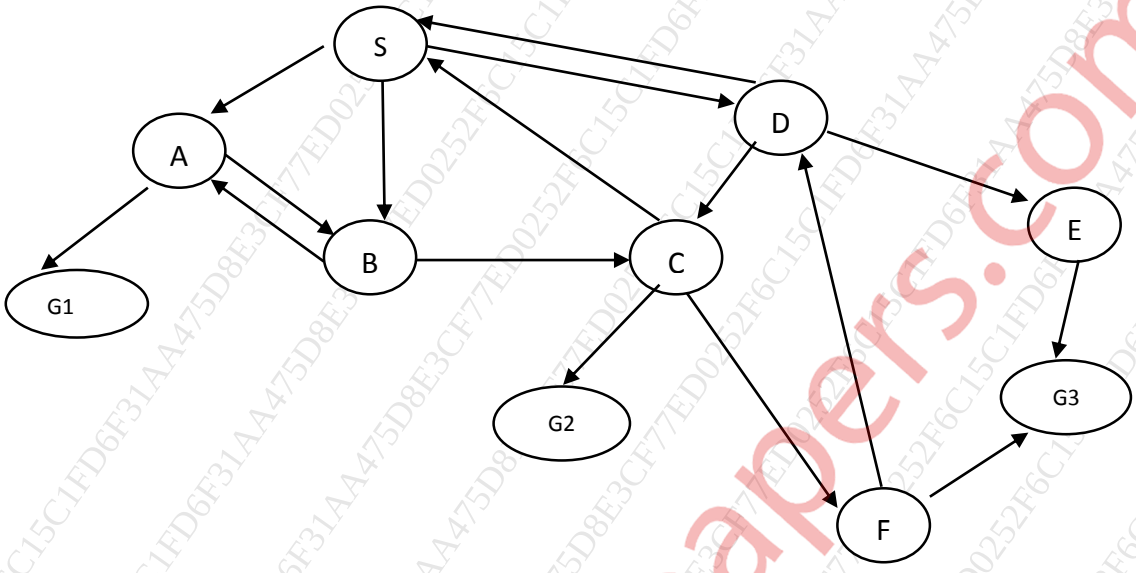
Q3)

a) Consider the following statements: [10]
a) All people who are earning are happy
b) All happy people smile
c) Someone is earning
Perform the following tasks:
i) Represent above statements in FOL
ii) Convert each to CNF
iii) Prove that someone is smiling using resolution technique. Draw the resolution tree

b) What do you understand by forward chaining and backward chaining. Explain in detail [10]

Q.4

a) For the given graph, the table below indicates the path costs and the heuristic values. S is the start node and G1, G2 and G3 are the goal nodes. Perform A* search to find the shortest distance path from S to any of the goal nodes. [10]



Edge	Cost	Edge	Cost	Edge	Cost
SA	5	BA	2	DS	1
SB	9	BC	1	DC	2
SD	6	CS	6	DE	2
AB	3	CG2	5	EG3	7
AG1	9	CF	7	FD	2
				FG3	8
Node	Heuristic	Node	Heuristic	Node	Heuristic
S	5	D	6	G1	0
A	7	E	5	G2	0
B	3	F	6	G3	0
C	4				

b) What is planning in AI? Discuss partial order planning and hierarchical planning in detail [10]

Q 5)

a) Explain the concept of genetic programming [10]

b) What is formulation of a problem. Formulate the Wumpus world problem in terms of following components: initial state, actions, successor function, goal test, path cost. [10]

Q.6 Write short notes on : [20]

a) Applications of AI

b) Simulated annealing

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