Regn. No. | | | | | | | | |

MANIPAL INSTITUTE OF TECHNOLOGY
(Constituent Institute of Manipal University)
MANIPAL-576104

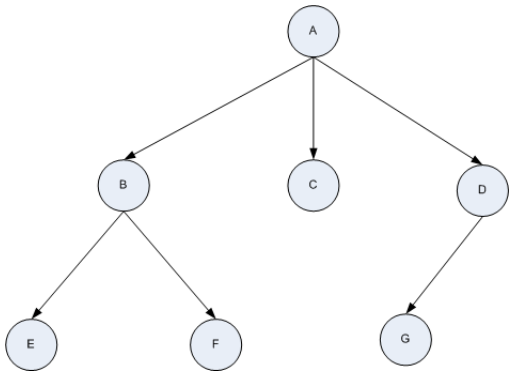
VII SEMESTER B.E(CSE) DEGREE MAKE UP EXAMINATION
JAN- 2013
CSE-423 ARTIFICIAL INTELLIGENCE(ELECTIVE-III)
10-1-2014

TIME:03 HOURS MAX.MARKS : 50

Note : Answer any **FIVE** full questions.

1. (a) What is a rational agent ? Explain. (2)
   (b) What is a task environment ? (2)
   (c) Explain the following with a diagram
      i. goal-based agent (3)
      ii. utility-based agent (3)

2. (a) In the following graph shown if A is the start vertex and G is the goal state determine the order of traversal if the search algorithm uses

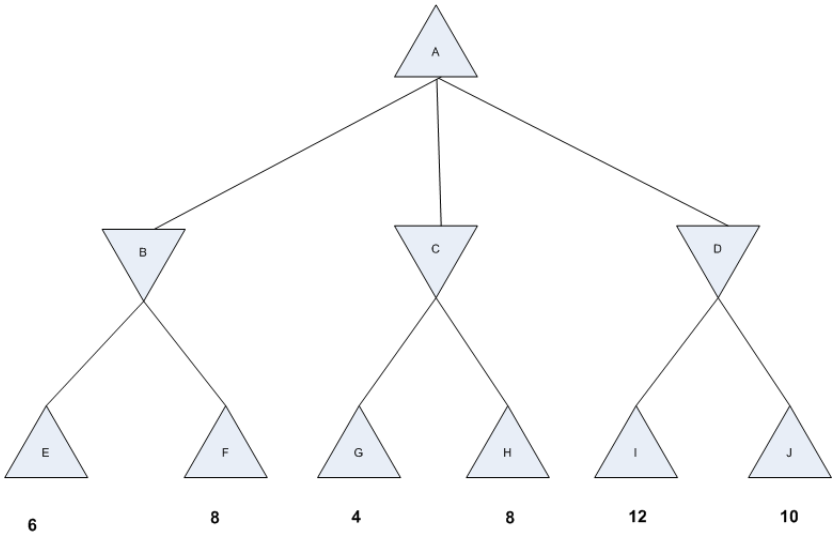


      i. Breadth-first search (2)
      ii. Depth-first search (2)
      iii. Bi-directional search (2)
   (b) How is an informed search strategy different than non-informed search strategy ? (2)
   (c) Explain A* search strategy with an example. (2)

3. (a) If two heuristic functions h1 and h2 are available, where h1< h2 then which of the heuristic function to be applied in the search algorithm ? why ? (2)

(b) i. Write the alpha-beta pruning algorithm. (2)

ii. In the following zero sum game, determine the nodes which are pruned when alpha-beta pruning is applied. Show clearly the trace of algoritm running. (4)



(c) Decide whether each of the following sentences is valid, unsatisfiable or neither.

i. $Smoke \vee Fire \vee \neg Fire$ (1)

ii. $(Smoke \Rightarrow Fire) \Rightarrow (\neg Smoke \Rightarrow \neg Fire)$ (1)

4. (a) Represent the following sentences using First order logic

i. Paris and Marseillas are both in France (1)

ii. No two adjacent countries have the same map colour (1)

iii. No region in South America borders any region in Europe (1)

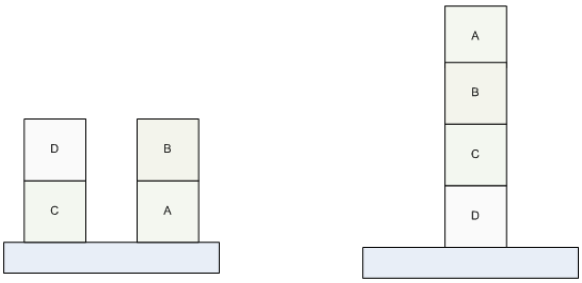
(b) Convert the following sentences to CNF.

i. $B \Rightarrow F$ (1)

ii. $C \wedge F \Rightarrow \neg B$ (1)

iii. $A \Leftrightarrow (B \vee E)$ (1)

(c) Write the detailed planning steps for solving the following blocks world problem. (4)



5. (a) Explain the following
    i. Ontology (3)
    ii. Semantic Nets (3)
    iii. inference using full joint distributions (3)

   (b) Represent the predicate $Overlap(i, j)$ on time interval. (1)

6. (a) Explain Baye's Rule and its use. (3)

   (b) Explain Single-Layer Feed-Forward Networks (2)

   (c) Explain the various machine-learning techniques. (3)

   (d) Explain Fuzzy-Sets with an example. (2)