Intelligent Systems

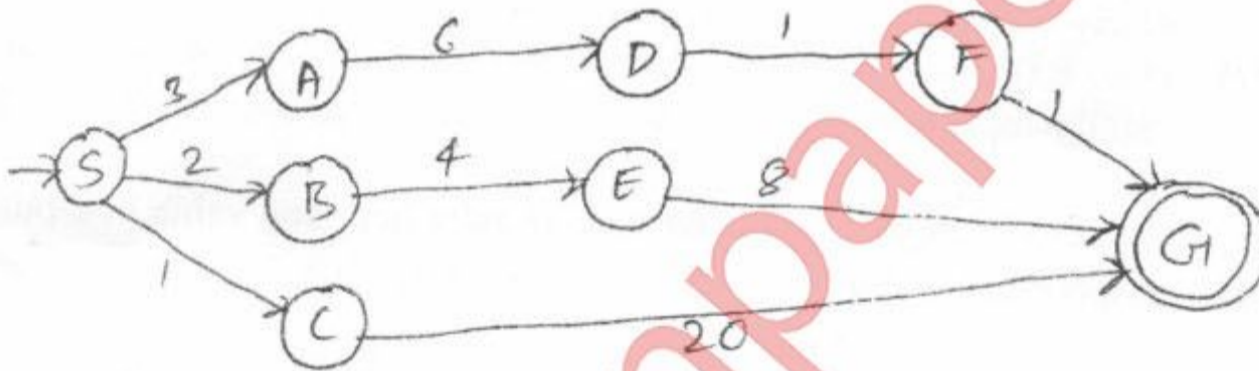**Q.P. Code :** 790802

(3 Hours) [Total Marks : 80

N.B. : (1) Question **No.1** is **compulsory**.
     (2) Attempt **any three** out of remaining **five**.

1. (a) Solve the given puzzle using crypt arithmatic method.   5

	B	A	S	E
+	B	A	L	L
G	A	M	E	S

  (b) Apply uniform cost search Algorithm on given graph.   5

  (c) Explain the limitation of propositional logic wth suitable example.   5

  (d) Write a note on Expert system shell.   5

2. (a) Consider the examples.   10
    (i) If Triangle is equilateral then it is isosceles. "AB" "AC"
    (ii) If Triangle is isosceles then two sides 'A' and 'B' are equal.
    (iii) If 'AB' and 'AC' are equal then Angle 'B' and 'C' are equal.
    (iv) ABC is an equilateral Triangle.
Prove that angle 'B' is equal to angle 'C' using inferencing techniques of modus ponen and Resolution.

  (b) Give the comparative analysis of BFS, DFS, Iterative deeping and Bidirectional   5
search strateges with respect to Time complexity, Space complexity, Optimatity
and Completnes.

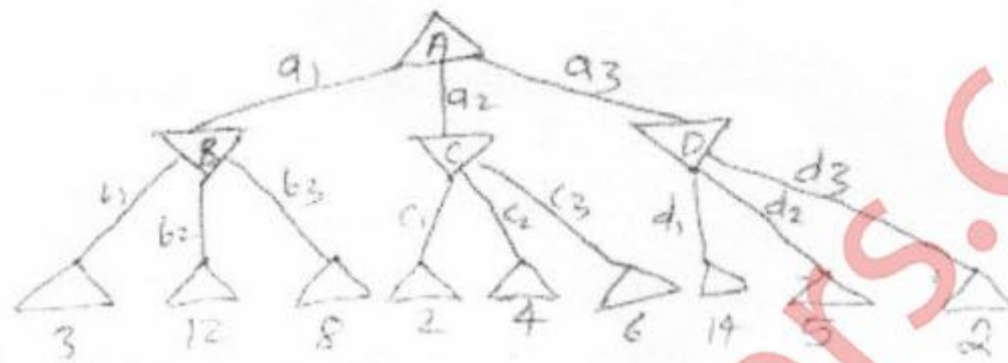 (c) Explain model based Reflex Agent with block diagram.   5

[TURN OVER

3. (a) Consider the knowledge base KB that contains the following propositional   10
logic sentences.

$Q \Rightarrow P$

$P \Rightarrow \neg Q$

$Q \vee R$

  (i) Construct a Truth table trat shows the truth value of each sentence in KB and indicate the model in which the KB is true.

  (ii) Does KB entail R ? Use the definition of entailment to justify your answer.

  (iii) Does KB $R \Rightarrow \neg P$ entail ? Extend the truth table and use the definition of entailment to justify your answer.

  (iv) Does KB $Q \Rightarrow \neg R$ entail ? Extend truth table and use the definition of entailment to justify your answer.

  (b) What is heuristic function ? How we can consider heuristic value in 8-puzzle   5
problem explain?

  (c) Explain PEAS descriptor for Part picking robot and medical diagnosis system.   5

4. (a) You have two neighbours, John and Mary, who have promised to call you at   10
work when they hear the alarm. John always calls when he hears the alarm, but
sometimes confuses the telephone ringing with the alarm and calls then, too.
Mary on the other hand, likes rather loud music and sometimes misses the
alarm altogether. Given the evidence of who has or has not called, we would
like to estimate the probability of a burglary.

  Draw a Bayesian network for this domain with suitable probability tables.

  (b) What is satisfiability ? Explain with suitable example.   5

  (c) Draw and Explain the Expert system Architecture.   5

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5. (a) Consider the given Game Tree. Apply the Aplpha- Beta pruning algorithm and decide, what is to be the next best move ? (Δ - max node , ∇- min node) **10**

(b) Write prolog program for generating Fibonacci series. 5

(c) Write a note on conditional probabililty and its role in AI. 5

6. (a) Measures 3 and 4 liters of milk when jug of size 7 and 2 are available. 5

(b) Formulate state space search problem for vaccume world cleaner. 5

(c) What is Ontology ? Explain with real world example. 5

(d) What do you mean by Quantifier and its types? Explain with example. 5