**Paper / Subject Code: 89284 / Artificial Intelligence**

Q. P. Code : 12281

**Time: (3 Hours)**           **Max Marks: 80**

**NOTE: -** Q1 is compulsory
       Solve any three from remaining.

Q1. Solve any **four** from following.                [20]
   a. Compare the importance of Partial order planning over Total order planning.
   b. What data is used to evaluate award and punishment of robot navigation?
   c. Explain the categorization of Intelligent System.
   d. How AI will help in the Robotics application.
   e. Generate the parse tree for a sentence "The *cat ate the fish*".
   f. What do you mean by state space representation? Explain with example the necessity
      of it

Q2.   a. What actions would you take to prove "Some who are intelligent can't read" using
      prepositional logic                   [10]
       1. Whoever can read is literate.
       2. Dolphins are not literate.
       3. Some dolphins are intelligent.

   b. Solve the Air cargo transport problem using Planning. It involves loading and
      unloading cargo onto and off of planes and flying it from place. Initial State is
      cargo 1 and plane 1 is at Mumbai airport, cargo 2 and plane 2 is at Delhi
      airport. Goal State is cargo 2 should be at Mumbai airport and cargo 1 should
      be at Delhi airport.                     [10]

Q3.   a. Apply A* algorithm on the following graph. Heuristic values are
      h(S) = 15, h(A) = 14, h(D) = 12, h(B) = 10,    h(E) = 10, h(C) = 8 , h(F) = 10,
      h(G) = 0.                                   [10]
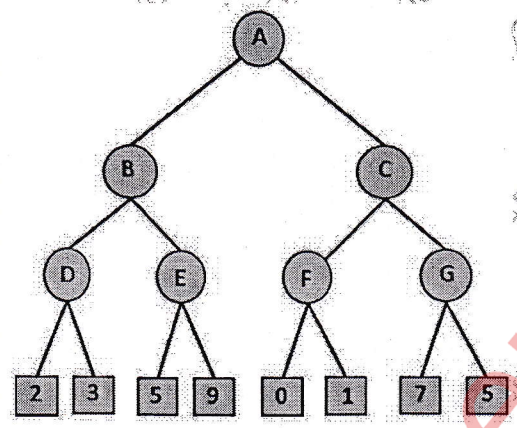      S is the start node and G is the goal node.
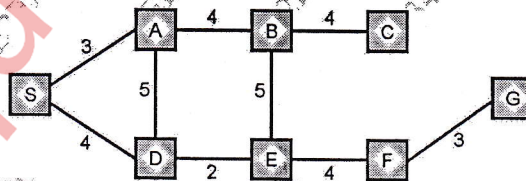


   b. Explain the Depth Limit search and Depth first iterative deepening search.    [10]

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Q4. a. Apply the alpha beta pruning on following example by considering the root node a max. [10]



b. Explain PEAS descriptors also state PEAS description for online English tutor. [10]

Q5. a. Explain Problem formulation also give the initial state, goal test, successor function, and cost function for the following.
Choose the formulation that is precise enough to be implemented.
**Problem statement:** A 3 foot tall monkey is in a room where some bananas are suspended from the 8 foot tall ceiling. He would like to get bananas. The room contains two stackable, movable, climbable 3 foot high crates. [10]

b. Explain the concept of PAC learning [10]

Q6 . Write detailed note on following. (**Any two**) [20]
   a. Hill Climbing Algorithm and it's Limitations.
   b. Forward and Backward Chaining
   c. Language models of Natural Language Processing

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