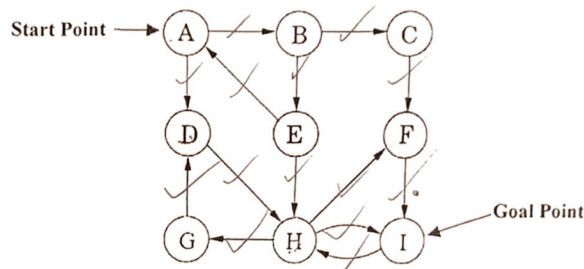




- Instructions: 1. Consider spending time/elaborating answers according to respective marks weightage.  
2. The marks for each question or its part are mentioned within the square bracket [ ] at the end of the question.  
3. There will be step marking, so solve the problem by following all the steps and mentioning logic/theorem clearly. Direct answers will not be awarded any mark.  
4. Assume any missing data suitably and clearly mention it.

- Q.1 What do you mean by task environment in artificial intelligent systems? Explain with a suitable example. [3]  
Q.2 For the graph given below, create a tree. Use Depth-first search to reach "I" with "A" as initial state. Clearly mention each stage of search along with corresponding frontier. [7]



- Q.3 Represent the following knowledge in the form of Logic using proper syntax: [1]  
(a) I have Dairy-Milk or 5-star chocolate. [1]  
(b) Every man respects his parent. [1]  
(c) If I am sleepy then I go to bed. [1]
- Q.4 Cite the meaning of the following Logic sentences: [1]  
(a)  $\forall x \text{ fruits}(x) \wedge \text{ripe}(x) \rightarrow \text{Tasty}(x)$  [1]  
(b)  $\exists x [\text{student}(x) \rightarrow \text{failed}(x, \text{Science}) \wedge \forall (y) [\neg(x=y) \wedge \text{student}(y) \rightarrow \neg \text{failed}(y, \text{Science})]]$  [1]
- Q.5 A dice is rolled twice. What is the probability of getting 3 on the first roll and not getting 5 on the second roll? [2]
- Q.6 The manufacturer of an electric circuit provides 1 year warranty on its circuit based on its successful operation for 95% of cases. The probability of blowing a fuse for that circuit is 0.1. An electrician knows that a blown fuse causes failure of circuit in 60% of the cases. If the circuit has failed, what is the probability that fuse is blown. [3]