

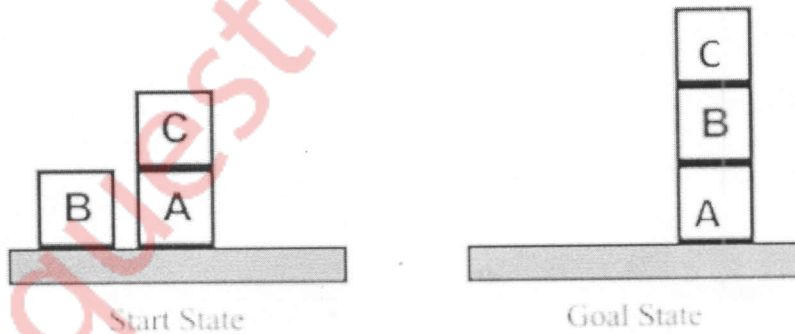
Note:

- (i) Each question carries 20 marks
- (ii) Question 1 is compulsory
- (iii) Attempt any three (3) from the remaining questions
- (iv) Assume suitable data wherever required

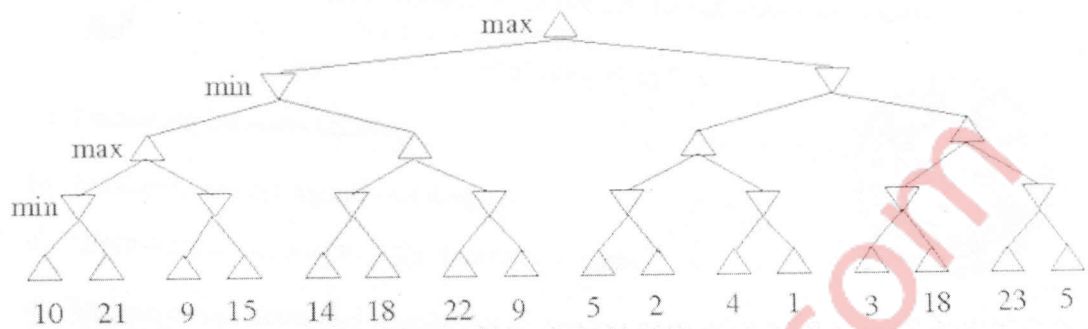


- Q.1. Attempt any four (4) questions from the following. [20]
- a) Define Intelligent Agent. What are the characteristics of Intelligent Agent?
 - b) Give State space representation for 8 puzzle Problem. What are possible Heuristic functions for it?
 - c) What is FOPL? Represent the following sentences using FOPL
 - i) John has at least two friends
 - ii) If two people are friends then they are not enemies.
 - d) Differentiate between forward and backward chaining.
 - e) Define Belief Network. Explain conditional Independence relation in Belief Network with example.

- Q.2 a) Draw and Describe the Architecture of Utility based agent. How is it different from Model based agent? [10]
- b) Explain A* Algorithm with example. [10]
- Q.3 a) Explain Resolution by Refutation with suitable example [10]
- b) Give the partial order plan for the following blocks-world-problem [10]



Q.4 a) Apply Alpha-Beta pruning on following example considering first node as MAX [10]



b) Explain different Inference Rules for First Order Predicate Logic. [10]

Q.5 a) Define the terms chromosome, fitness function, crossover and mutation as used in Genetic algorithms. Explain how Genetic algorithms work. [10]

b) What are steps involved in natural language processing (NLP) of an English sentence? Explain with an example sentence. [10]

Q. 6 Write short note on any two of the following [20]

- a) Expert System Architecture and Applications
- b) Local Search Algorithms
- c) Decision Tree learning