Bachelor Level/ Third Year/ Fifth Semester/ Science   **Full Marks: 60**

Computer Science and Information Technology (CSc. 304)   **Pass Marks: 24**

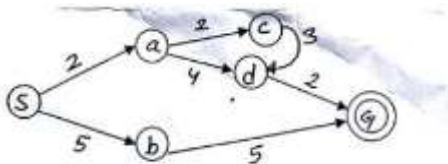**(Artificial Intelligence)**   **Time: 3 hours**

Candidates are required to give their answers in their own words as far as practicable.

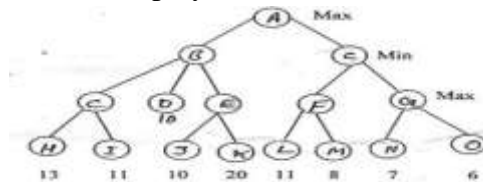*The figures in the margin indicate full marks.*

Attempt all the questions.

1. How the dimensions like thinking humanly and thinking rationally are used to evaluate intelligence behavior of a machine.   (6)
2. What are rational agents? How episode task environment differs from sequential task environment? Support your answer with suitable examples. (1+5)
3. In problem solving, why problem formulation must follow goal formulation? How state space representation can be used to solve a problem? Support your answer with example. (2+4)
4. How uniform cost search works? Given following state-scape, use uniform cost search algorithm to find the goal. Show each of iterations.

Here S is start state and G is goal state.

5. What is the need of alphabet pruning in game search? Given following search space with utility, perform mini-max search and identity alpha-beta cutoff if any. Play from perspective of max player first   (1+5)

6. Define knowledge representation system. How knowledge is represented using semantic networks? Illustrate with an example.   (6)

7. How concept of most specific consistent hypothesis and most general consistent hypothesis are used in learning through examples. How generalization specialization tree is maintained for these concepts?   (6)
8. What do you mean by machine vision? Discuss the components of a machine vision system.(2+4)
9. What do you mean by marginalization in probability distribution? Consider in Nepal, 51% of adults are males and rest are females. Consider one adult is randomly selected for a survey of drinking alcohol. It is found that 15% of males drink alcohol where 2% of female drink alcohol. Now find the probability that the selected adult is male.(1+5)
10. Convert following sentences to FoPI.(4)
    If every helper is busy then there is a job in a queue.
    A job is in queue but the helper is not busy.Every helpers are teased by someone.