

(2 ½ Hours)

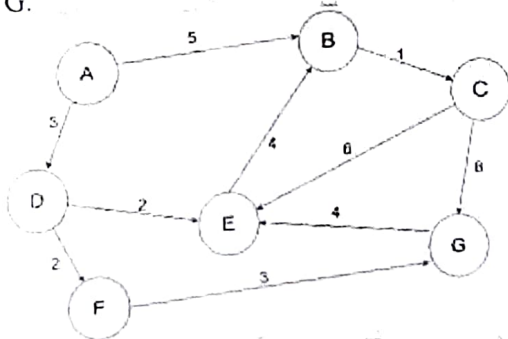
[Total Marks: 75]

- N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1 Attempt ANY FOUR from the following:

(20M)

- (a) Define AI. State any four applications of AI.
(b) What is PEAS? Mention it for Automated Taxi Driver and Soccer Playing Robot.
(c) Describe a Simple reflex Agent in detail.
(d) Explain following task environments with example.
i. Episodic vs. Sequential
ii. Deterministic vs. Stochastic
(e) Consider the following graph. Let the starting node be A and the goal node be G.



- (f) Find the Path Cost using Uniform Cost Search Algorithm.
Explain A* search Algorithm. Also explain conditions of optimality of A*

(20M)

Q. 2 Attempt ANY FOUR from the following:

- (a) Write a short note on the AI Knowledge cycle.
(b) Explain Backpropagation Neural Network.
(c) Write a note on K-Nearest Neighbours.
(d) Explain any 5 membership functions of Fuzzy Logic Systems.
(e) What is Classification in Machine learning? Explain it with one example.
(f) Explain the concept of Regularization.

(20M)

Q. 3 Attempt ANY FOUR from the following:

- (a) Write a short note on the Hidden Markov Model.
(b) Explain Q-Learning in detail.
(c) What is Association rule mining?
(d) Explain Bayesian Learning with an example.
(e) Define Reinforcement Learning. Explain the various terms used in it.

- (f) Explain the use of following Metrics used to evaluate the strength of Association Rule Mining with one example.
- i) Support
 - ii) Confidence
 - iii) Lift

Q. 4 Attempt ANY FIVE from the following:

(15M)

- (a) Explain Acting Rationally approach of AI.
- (b) What are the essential Properties of Searching Algorithms?
- (c) Differentiate between Inductive and Deductive Reasoning.
- (d) Write a note on following
 - i) Entropy
 - ii) Information Gain
- (e) What are hidden variables? Give example.
- (f) Write a note on Unsupervised Learning
