

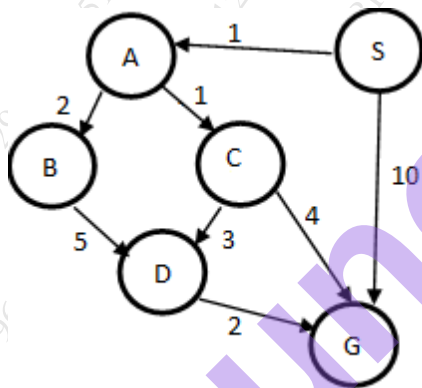
(2 ½ Hours)

[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) What is PEAS? Give a PEAS description for playing a tennis match and vacuum cleaner problem.
- (b) Define AI? Explain any 2 foundations of AI
- (c) Explain the 8-Queens Problem and write the States, Initial state, Actions, Transition Model, Goal state & Path cost to formulate it.
- (d) Explain Depth First Strategy along with pseudocode.
- (e) Write a short note on model based agent.
- (f) Find the optimal path & path cost for the following graph using A* search algorithm. (S is a Start state & G is a Goal State)



State	h(n)
S	5
A	3
B	4
C	2
D	6
G	0

Q. 2 Attempt ANY FOUR from the following:**(20M)**

- (a) Describe knowledge representation. Explain frame representation technique of knowledge representation in detail.
- (b) Write a note on Multilayer Feed Forward Neural Network.
- (c) Explain the concept of Overfitting and Underfitting of model.
- (d) What is Regression? Explain Simple Linear Regression with example.
- (e) Define Ensemble Learning. Explain Boosting technique in detail.
- (f) Explain KNN classifier with example.

Q. 3 Attempt ANY FOUR from the following:**(20M)**

- (a) Write a short note on Q learning.
- (b) Differentiate between reinforcement and unsupervised learning.
- (c) For the given transaction dataset-

TID	Items Bought
100	Bread, Cheese
200	Bread, Cheese, Juice
300	Bread, Milk
400	Cheese, Juice, Milk

Calculate the following :-

- i) Support(bread) ii) Support(bread->milk)
- iii) Confidence(bread->cheese) iv) Confidence(bread->milk)
- v) Lift(bread->cheese)
- (d) Explain Hidden Markov Model in detail.
- (e) What is Clustering? Explain with example.
- (f) Write a short note on association rule mining.

Q. 4 Attempt ANY FIVE from the following:**(15M)**

- (a) Explain Turing Test Approach in AI.
- (b) Explain Deterministic vs Stochastic Task Environment with suitable example.
- (c) Write a note on Active Reinforcement learning.
- (d) Explain Bellman Equation in detail.
- (e) What is the role of Reasoning in AI?
- (f) Explain the concept of gradient descent.
