Name:
Enrolment No:

UPES
UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Artificial Intelligence **Semester: 7**
Program: B. Tech CSE splz ECRA **Time 03 hrs.**
Course Code: CSEG344 **Max. Marks: 100**

SECTION A

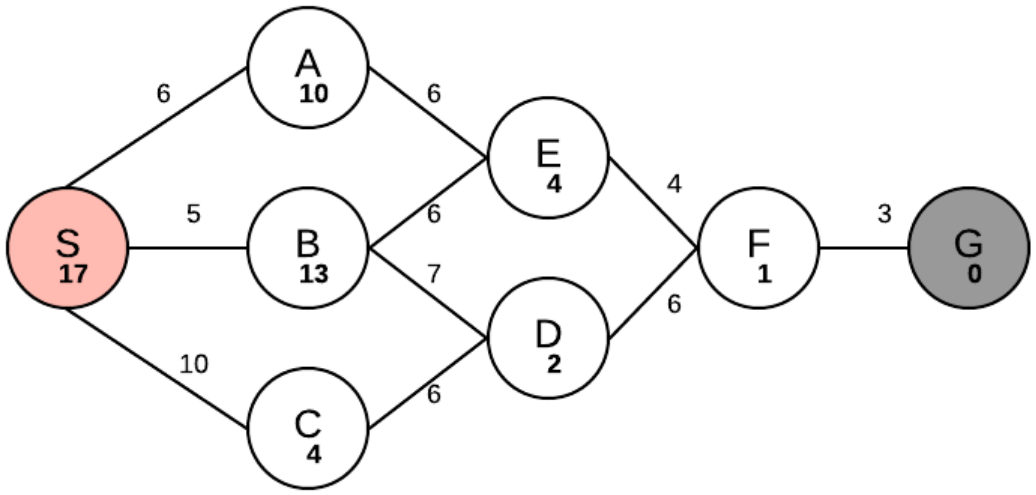
Q 1	Justify how a learning-based agent is effective against goal-based agent.	4	CO1
Q 2	Explain, with example, why backward chaining is considered goal-driven and forward chaining is considered data-driven.	4	CO3
Q 3	Show that DFS is neither complete nor optimal search.	4	CO2
Q 4	Perform unification of the following: a) p(x, x) = p(y, f(y)) b) f(A, x, f(g(y))) = f(z, f(z), f(A))	4	CO3
Q 5	Discuss the main aspects considered before solving a complex AI problem. State your understanding on state space representation in AI.	4	CO1

SECTION B

Q 6	Discuss the following, with example: • Intelligent Agents (3 marks) • A* Algorithm (3 marks) • Evaluation metrics of all search strategies (4 marks)	10	CO1,CO2
Q 7	Consider the following axioms: • Anyone whom Mary loves is a football star. • Any student who does not pass does not play. • John is a student • Any student who does not study does not pass. • Anyone who does not play is not a football star. Prove using resolution process that "**If John does not study, then Mary does not love John**". **OR** What is the correlation of planning and robotics? Detail how agent navigation problems can be addressed using path planning & heuristic approaches.	10	CO3
Q 8	Draw and explain biological and artificial neural network. What are the roles of activation function in ANN? List some of the linear and nonlinear activation functions with their suitable representations.	10	CO4
Q 9	The sales of a company (in million dollars) for each year are shown in the table below. x (year): 2005, 2006, 2007, 2008, 2009 y (sales): 12, 19, 29, 37, 45 i. Find the least square regression line y = a x + b. ii. Use the least squares regression line as a model to estimate the sales of the company in 2012.	10	CO4

SECTION-C

Q 10	The following is the ruleset of a simple weather forecast expert system: 1) IF cyclone THEN clouds 2) IF anticyclone THEN clear sky 3) IF pressure is low THEN cyclone 4) IF pressure is high THEN anticyclone 5) IF arrow is down THEN pressure is low 6) IF arrow is up THEN pressure is high	20	CO3

	Show your answer in a table naming the rules matching the current working memory (conflict set),which rule you apply, and how the working memory contents changes on the next cycle after a rule has fired:		
Q 11	Explain the usage of alpha beta pruning in Game Playing. Find out the alpha beta cuts for the following tree. **OR** With the following tree provided, differentiate how the planning is carried out between informed and uninformed search techniques like A* & DFS. Justify your answer in the following perspectives;  a. Philosophy b. Methodology c. Processing in terms of lists/queue adopted d. Efficiency in terms of time & space complexity	20	CO2