Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, May 2020

Course: Artificial Intelligence **Semester: V**
Program: B. Tech. CSE OSOS **Time 03 hrs.**
Course Code: CSEG 3005 **Max. Marks: 100**

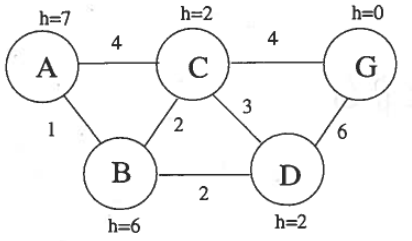
SECTION A

1. **Each Question will carry 5 Marks**
2. **Instruction: Complete the statement / Select the correct answer(s)**

S. No.	**Question**	**CO**
Q 1	The phases of NLP are ……, …….. ,……., …….., ……..	**CO4**
Q2	The corpus available for NLP are …… , ……. ,……. , …… , ……..	**CO4**
Q3	Which statement is not true regarding BFS (Breadth First Search)? a) BFS will get trapped exploring a single path b) The entire tree so far been generated must be stored in BFS c) BFS is not guaranteed to find a solution if exists d) BFS is nothing but Binary First Search	**CO2**
Q4	State true or false a) A heuristic function solve mathematical problems b) A heuristic function takes parameters of type string and returns an integer value c) A heuristic function return type is nothing d) A heuristic function does not maps from problem state descriptions to measures of desirability e) An algorithm A is admissible if it is not guaranteed to return an optimal solution when one exists	**CO2**
Q5	The properties of agent include: a) Perceives its environment through sensors and acting upon that environment through actuators b) Takes input from the surroundings and uses its intelligence and performs the desired operations c) A embedded program controlling line following robot d) All of the mentioned	**CO1**
Q6	The Task Environment of an agent consists of _____ a) Sensors b) Actuators c) Performance Measures d)Environment e) None of the mentioned	**CO1**

SECTION B

1. **Each question will carry 10 marks**
2. **Instruction: Write short / brief notes**

Q 7	Differentiate between informed and uninformed search techniques .Can BFS be categorized in both of the mentioned categories	**CO1**
Q 8	Explain CSP with example? What is constraint propagation?	**CO1**
Q 9	Figure 2 is a graph to be searched at A and ending at G. Heuristic values are given and edge values represent actual cost. Assume the child nodes are in alphabetical order and use the same order to break ties if necessary. Perform A* search to find the final path returned by completing the given table  Figure 2: *Search graph.*	**CO2**

Expanded node	Partial path leading to node	Total cost of Partial path

Q 10	Provide explanation for each 1)If a search method is guaranteed to find an optimal solution on trees then that method is also guaranteed to find optimal solution on graphs. 2) An optimal solution path with positive costs will never repeat states. 3) Alpha Beta pruning can alter the min-max value of the root of the game tree. 4) When performing min-max search from left to right the leftmost branch of game tree will never be pruned.	**CO2**
Q 11	Explain the concept of backward chaining and forward chaining with proper example? OR Explain unification and resolution with respect to predicate logic.	**CO3**

Section C

1. **Each Question carries 20 Marks.**
2. **Instruction: Write long answer.**

Q12	Harry installed a new burglar alarm at his home to detect burglary. The alarm reliably responds at detecting a burglary but also responds for minor earthquakes. Harry has two neighbors David and Sophia, who have taken a responsibility to inform Harry at work when they hear the alarm. David always calls Harry when he hears the alarm, but sometimes he got confused with the phone ringing and calls at that time too. On the other hand, Sophia likes to listen to high music, so sometimes she misses to hear the alarm. Compute the probability of Burglary Alarm. **Calculate the probability that alarm has sounded, but there is neither a burglary, nor an earthquake occurred, and David and Sophia both called the Harry.** OR a) Explain the application of regression Analysis in 1) causal analysis, (2) forecasting an effect, (3) trend forecasting.(10 marks) b) The data below is a list of diamonds, by weight, and their corresponding prices.	**CO4**

Weight (carats)	0.3	0.4	0.5	0.5	1.0	0.7
Price ($)	510	1151	1343	1410	5669	2277

1. Find the linear regression line, letting weight be the predictor variable x. (Use technology.)

2. Find the linear correlation coefficient. (Use technology.)

3. Find the best predicted price for a diamond that weighs 0.8 carats. (Show your work.)

4. What is wrong with using the regression line to predict the price of a diamond that weighs 2.0 carats?