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

Course: Artificial Intelligence   **Semester: VII**
Program: B Tech (CSE-ECRA)   **Time 03 hrs.**
Course Code: CSEG-3005   **Max. Marks: 100**

SECTION A
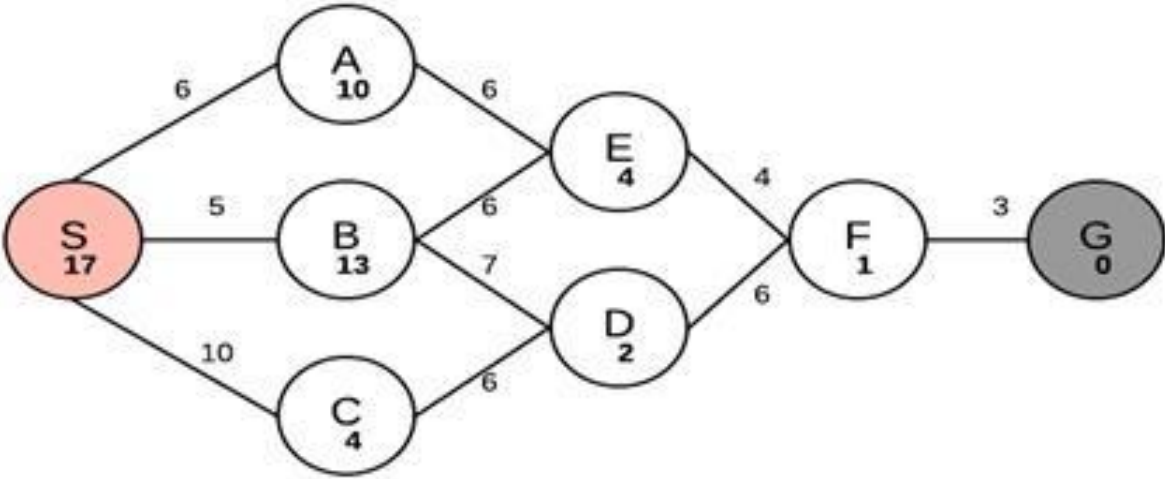
1. **Each Question will carry 5 Marks**
2. **Instruction: Answer the following**

S. No.	Question	CO
Q 1	How does alpha-beta pruning overcome the shortcomings of min-max game search algorithm?	CO2
Q2	Differentiate between Inductive and Deductive Machine Learning. Give example	CO4
Q3	Describe the PEAS environment for following Intelligent Agent: 'Automated Taxi'	CO1
Q4	**(a).** Given tree below, in order to reach goal node 'L', list the order in which nodes will be visited in (i). Breadth first search (ii). Depth first search. **[2.5 Marks]** **(b)** Discuss how heuristic search techniques are different from uninformed search techniques. Give at least 2 differences **[2.5 Marks]**	CO2
Q5	Give one real life example of when regression analysis is used?	CO4
Q6	Why are neural networks most widely used computational methodology for modern data processing paradigms	CO4

SECTION B

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

Q 7	Discuss applications of AI, in health care sector.	CO1

Q 8	With a neat labeled illustration, elaborate on problems in Hill Climbing Search. Briefly outline the solutions	CO2
Q 9	Using the following graph, demonstrate how best path is computed using (a). Greedy search (b). A* search 	CO2
Q 10	Differentiate between forward chaining and backward chaining. Use an example to explain.	CO3

Q 11	(a). Unify the following :
	p(x,f(y)) , p(a,f(g(z))) [1 M]
	
	(b). Convert to Predicate Logic [2 M]
	    (i). Bill takes either analytics or geometry not both
	    (ii). Every example in the book had helped some student in the class
	
	(c). Some axioms are given below: [7 M]
	
	  1. Every bird sleeps in some tree.
	  2. Every loon is a bird, and every loon is aquatic.
	  3. Every tree in which any aquatic bird sleeps is beside some lake.
	  4. Anything that sleeps in anything that is beside any lake eats fish.
	     Prove by 'resolution by refutation': Every loon eats fish.
	
	     (i)Convert to clausal form (ii). Do resolution by refutation (iii) Draw resolution tree
		CO3

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

Q12	Solve using graphical method the optimization problem represented below
	
	Minimize $Z=3x_1 + 5x_2$
	St,
	    $x_1+3x_2 >= 3$
	    $x_1 + x_2 >=2$
	
	$x_1, x_2 >= 0$
	
	 OR
	Given below is data set with four variables and 5th variable is dependent variable. Use Naïve Bayes' Classifier to find, whether the person will be suffering from disease 'Z', if having conditions such as, **for Blood Pressure=high, Fever=no, Diabetes=yes and Vomit=yes**.
		CO4

Blood Pressure	Fever	Diabetes	Vomit	Suffering from disease 'Z'
high	high	yes	no	no
high	high	yes	yes	no
low	high	yes	no	yes
normal	mild	yes	no	yes
normal	no fever	no	no	yes
normal	no fever	no	yes	no
low	no fever	no	yes	yes
high	mild	yes	no	no
high	no fever	no	no	yes
normal	mild	no	no	yes
high	mild	no	yes	yes
low	mild	yes	yes	yes
low	high	no	no	yes
normal	mild	yes	yes	no