Name: Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Supplementary Examination, 2022

Course: Artificial Intelligence   **Semester: VI**
Program: B. Tech (ALL CS branches)   **Time : 03 hrs.**
Course Code: CSEG344   **Max. Marks: 100**

Instructions:
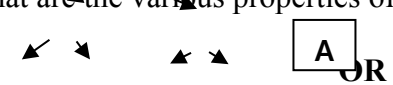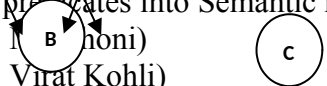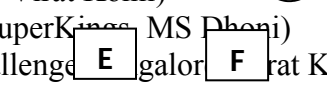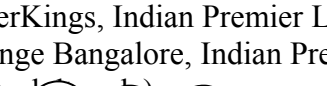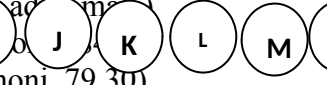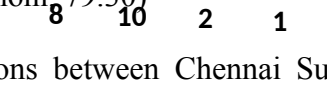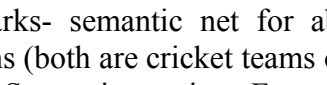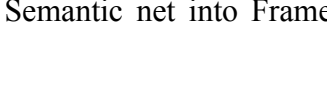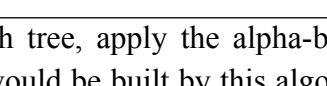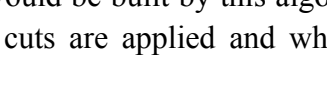
SECTION A (20 marks)

S. No.		Marks	CO
Q 1	Illustrate your idea on constraint satisfaction problems, with appropriate example?	4	CO2

Q 2	Sketch the difference between:
	
	    a. Informed Search Vs Uninformed Search.
	    b. Forward Chaining Vs Backward Chaining.
		4	CO2

Q 3	Write a short note on **goal based** intelligent agents, with diagram	4	CO1
Q 4	What kind of mistakes might ES make and why? Why is it easier to correct mistakes in ES than in conventional programs?	4	CO4
Q 5	Elaborate "The Turing Test". What would a computer need to pass the Turing test?	4	CO1

SECTION B (40 Marks)

S. No.		Marks	CO

Q 6	Write a short note on the following, with example:
	  a) Backtracking Search
	  b) Learning using intelligent agents
		10	CO2

Q 7	**Convert the following sentences into predicates:**
	
	    i. Every city has a dogcatcher who has been bitten by every dog in the city.
	   ii. It rained on Tuesday.
	  iii. If it doesn't rain tomorrow. Tom will go to the mountains.
	   iv. All person play football are tall.
	    v. Some person like anchovies.
	   vi. Every person who get married and have at least a child is called
		10	CO3

	father vii. John didn't study but is lucky. viii. Anyone who studies or is lucky can pass all their exams. ix. Anyone passing their exams and winning the lottery is happy. x. Anyone who is lucky win the lottery.		
Q 8	**The sales of a company (in million dollars) for each year are shown in the table below.** 	x (year)	2005	2006	2007	2008	2009
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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
Q 9	Discuss the architecture of an Expert system with diagram, in detail. Design the 2 IF-THEN type rules, for each, that help you to "**Buy a bike**" **OR** With the help of appropriate examples, show PROLOG as non-deterministic language. Also perform the following I/O operations (generate your own knowledge-base): a. Conjunction, Disjunction and Negation (with syntax) b. Generate a Recursive program in PROLOG c. Define 'consult','re-consult'.	10	CO4
	SECTION-C (40 Marks)		
Q 10	Consider the following sentences: d. John likes all kinds of food e. Apples are food f. Chicken is food g. Anything anyone eats and isn't killed by is food h. Bill eats peanuts and is still alive i. Sue eats everything Bill eats i. Translate these sentences into formulas in first order logic. (6) ii. Prove that John likes peanuts (4) iii. Give five examples of facts that are difficult to represent and manipulate	20	CO3

in Predicate logic. (5)
  iv.   What are the various properties of Well Formed Formulae? (5)

OR

Demonstrate the following predicates into Semantic nets:
  a) Is_a(Cricket player, MS Dhoni)
  b) Is_a(Cricket player, Virat Kohli)
  c) Instance(Chennai SuperKings, MS Dhoni)
  d) Instance(Royal Challenge Bangalore, Virat Kohli)
  e) Team(Chennai SuperKings, Indian Premier League)
  f) Team(Royal Challenge Bangalore, Indian Premier League)
  g) Is_a(Cricket player, Sad sample)
  h) Batting_avg(Virat Kohli, 50)
  i) Batting_avg(MS Dhoni, 79.30)

  1. Identify the Relations between Chennai SuperKings and Royal Challenge Bangalore. (10 marks- semantic net for above data and finding relation between given teams (both are cricket teams of IPL)
  2. Convert the above Semantic net into Frames representation. (10 marks for conversion)

Q 11	Given the following search tree, apply the alpha-beta pruning algorithm to it and show the search tree that would be built by this algorithm. Make sure that you show where the alpha and beta cuts are applied and which parts of the search tree are pruned as a result.	20	CO2