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B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2019. Fifth/Sixth Semester Computer Science and Engineering CS 6659 — ARTIFICIAL INTELLIGENCE (Common to Electronics and Instrumentation Engineering/Instrumentation and Control Engineering/Information Technology) (Regulation 2013) (Also Common to PTCS 6659 — Artificial Intelligence for B.E. (Part-Time) Computer Science and Engineering — Fifth Semester — Regulations — 2014) Time: Three hours Maximum: 100 marks Answer ALL questions. PART A — (10 × 2 = 20 marks) 1. List down the characteristics of Production system. 2. What are the performance measures used for analysing the search algorithms? 3. Distinguish between predicate logic and propositional logic. 4. Represent the following in Semantic Net, "All students like the subject AI". 5. List down the issues in Bayes theorem to deal with uncertain reasoning systems. 6. Define Fuzzification. 7. Distinguish between continuous planning and conditional planning. 8. List down the various Machine learning techniques. 9. List down the characteristics of Expert System. 10. What is the need of an Expert system Shell?			
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				PART B — $(5 \times 13 = 65 \text{ marks})$		
	11.	(a)	(i)	Analyse the following problems with respect to the seven	problem	
				characteristics:		
				(1) Travelling salesman problem		
				(2) 8-puzzle problem		
				(3) Towers of Hanoi		
				(4) Chess.	(8)	
			(11)	Explain Best First search algorithm with an example.	(5)	
				Or		
		(b)	(i)	Explain the constraint satisfaction procedure to s cryptarithmetic problem.	olve the	
				CROSS		
				+ ROADS		
				DANGER	(7)	
			(ii)	Explain AO^* algorithm with an example.	(6)	
	12.	(a)	(i)	Explain the Min Max game playing algorithm with an exar	nnle (6)	
			(ii)	Consider the following facts	apie. (o)	
				(1) All students in 4 th year are intelligent		
				(2) Raja is a 4th year student		
				(3) Ragu is a 3 rd year student		
		V	V	 (4) 3rd year students are not intelligent (5) 4th year students have no friends in 3rd year 	1	
				Represent the facts in predicate, convert to clause	form and	
				prove by resolution, "Raja is not friend of Ragu".	(7)	
				Or		
		(b)	(i)	Explain the unification algorithm with an example.	(6)	
		No.	(ii)	Consider the following facts	(0)	
				(1) There are 5000 employees in XYZ company		
-				(2) Employees earning more than Rs.25000/ annum pay	tax	
				(3) John is a manager in XYZ company		
				(4) Manager earns Rs.50,000		
				Represent the facts in predicate, convert to clause	form and	
				prove by resolution ,"John pays tax".	(7)	
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13.	(a)	(i)	Evnlain Damnotar Shafar these with an array	100
10.	(a)		Explain Dempster Shafer theory with an example.	(6)
		(ii)	How is reasoning done in Bayesian network?	(7)
			Or	
	(b)	(i)	Explain the concept of knowledge representation usin based system.	g Frame (6)
		(ii)	What are fuzzy membership functions? Explain the examples.	em with (7)
14.	(a)	(i)	Distinguish between STRIPS and ADL.	(5)
		(ii)	Explain the concept of learning using neural networks example.	with an (8)
				(0)
	0.5	(2)	Or	
	(b)	(i)	Explain the concept of learning by parameter adjustn learning by Macro operators.	
		(ii)	Explain the concept of learning using genetic algorithm	(8)
15.	(a)	Exp	lain the architecture of an expert system with a block diagra	m.
			Or	
	(b)		lain on the design principles involved in the following	g Expert
	V	(i) (ii)	DART ON S.CON	7
			PART C — $(1 \times 15 = 15 \text{ marks})$	
16.	(a)	(i)	Design a fuzzy washing machine that can decide the spe motor based on dirt level (low medium, high, large), continuous continuous decide the spe (cotton, wool, silk, blankets) and cloth weight (min, medium, besign the table to specify the membership value related fuzzy term. Fix the speed of motor as 10 rpm, 20 rpm and Derive rules for fixing motor speed.	loth type ed, max). d to each
		(ii)	Show how JTMS could be used in medical diagnosis. Con	sider the
			rules such as, "If you have a runny nose assume you l	
			unless it is allergy season".	(5)
			Or	
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(b) (i)	A diagnostic tes	st has a probability 0.95 of	f giving a positive result	
	when applied to	o a person suffering from :	a certain disease, and a	
	non-sufferer. It	0 of giving a (false) posit t is estimated that 0.5 %	of the population are	
	sufferers. Supp	ose that the test is now a	dministered to a person	
	(apart from th	have no relevant information ne fact that he/she comes ollowing probabilities:	on relating to the disease from this population).	
		est result will be positive;		
	(2) that, given	n a positive result, the perso	on is a sufferer;	
	(3) that, given	n a negative result, the pers	on is a non-sufferer;	
	(4) that the pe	erson will be misclassified.	(8)	
(ii)	share it with yo	res of apple juice in a 12 litt our best friend. But you have ottle. Design the production s	e all empty 8-litre and an	
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