R-17         R-17         IB JEACH. II Semester Supplementary Examinations Nov/Dec 2019         Formal Languages and Automate Theory         (Computer Science and Engineering)         Max. Marks: 70         Time: 3 Hours         Answer all five units by choosing one question from each unit {5 x 14 = 70 Marks}         UNIT-1         1. a) Construct DFA and NFA accepting the set of all strings with three consecutive zeroes.         7M         b) Analyze the procedure to convert NFA into DFA with illustration?         0R         2. a) Design a Moore machine to determine the residue mod 4 for each binary string treated as integor?         MUT-11         3. a) Prove L = (WW <sup>0</sup> / We {a, b}) is not regular?         M         0R         4         a) Discuss the closure properties of regular sets.         D         b) Construct NFA for the following regular sets.         b) Describe Pumping Lemma for regular sets.         b) Describe Pumping Lemma for regular sets.         b) Convert the given CFG to CNF S + aSa/ bSb/ a/ b         DR <th>Hall</th> <th>Ticke</th> <th>et Number :</th> <th></th>	Hall	Ticke	et Number :																																																																																																																																																									
II B.Tech. II Semester Supplementary Examinations Nov/Dec 2019 Formal Languages and Automata Theory (Computer Science and Engineering) Max. Marks: 70 Ime: 3 Hours Answer all five units by choosing one question from each unit [ $5 \times 14 = 70$ Marks] Ime: 3 Hours Answer all five units by choosing one question from each unit [ $5 \times 14 = 70$ Marks] Ime: 3 Hours Answer all five units by choosing one question from each unit [ $5 \times 14 = 70$ Marks] Ime: 3 Hours Answer all five units by choosing one question from each unit [ $5 \times 14 = 70$ Marks] Ime: 3 Hours Ime: 3 Hours Ime: 3 Hours Answer all five units by choosing one question from each unit [ $5 \times 14 = 70$ Marks] Ime: 3 Hours Ime: 3 Hour	Code	• 70	R-17																																																																																																																																																									
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3. a)       Prove L = $\{WW^{\mathbb{R}}/W\in \{a, b\}\}$ is not regular?       7M         b)       Obtain a regular grammar to obtain the set of all strings not containing three consecutive zeroes?       7M         OR         4. a)       Discuss the closure properties of regular sets.       7M         b)       Describe Pumping Lemma for regular sets.       7M         UNIT-III         5. a)       What is minimization of context free grammar and explain each with one example.       7M         D         OR         INIT-III         5. a)       What is minimization of context free grammar and explain each with one example.       7M         D         OR         INIT-III         5. a)       What is minimization of context free grammar and explain each with one example.       7M         D         OR         INIT-IV         D         ON the given CFG to GNF         S ABA         AAA/         DE/       INIT-IV         To construct PDA for the given CFG         S ABB       B >0S/1S/0       Test whether 0		b)	Construct NFA for the following regular expression $(0 + 1)^*(01+110)$ .	7M																																																																																																																																																								
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							UNIT-I				
	a)	What Op	perating	system	does? E	xplain a	bout the	structure	of ope	erating sy	rstem.
	b)	•	es of syst	•		•				0,	
	0)	51	,			-	DR				
	a)	Explain	the proc	ess state	es with s	-	nsition dia	aaram. A	lso exp	lain the F	PCB with
	~,	neat dia	-					-g			•=
	b)		•	Typlain	the dire	oct and	indirect	commun	lication	with ro	spect to
	5)		e passin					Sommar			
			- 1	5 - 9 - 5 - 5 - 5	-		UNIT-II				
	a)	Evolain	the kerne	ol I/O ou	Insvetor						
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	b)		tiate bet		d b)lle		I and Ke	rnal lava	throad		iting and
		turnarou			u b)03				lineau	u c) wa	illing and
		tarriaroe				C	DR				
	a)	How doe	es concu	irrency c	control o	ccur in o	operating	system	during	executio	n?
	b)	Explain	the Dinn	ina philc	osopher'	s proble	m using	monitors	?		
	,						UNIT-III				
	a)	For the f	following	i snansh	ot Find	the safe	sequenc	e usina	Banker	s algorith	nms
	u)		-	Allocation			Max			Available	
			A	B	C	А	B	С	А	B	C
		P0	0	0	2	0	0	4	1	0	2
		P1	1	0	0	2	0	1			
		P2 P3	1 6	3 3	5 2	1 8	3	7 2			
		P4	1	4	3	0	5	7			
			system i							_	II
		,	•			es for (C	02), Can	the reque	est arar	nted imme	ediatelv?
	b)	, ,		•		· ·	ad lock?	•	•		•
	0)	and avo		in metric			au iock:			e ueau pi	evention
			laanoo			C	DR				
	a)	What an	e virtual	machine	s? Exnl		WARE a	rchitectu	re with	neat dia	nram?
	,				•					nout ala	grann
	b)	Conside	er the foll	-	-						
	,			Se	gment		<b>Base</b> 219	Len			
					0	1			1()		
					0 1				)0 4		
					0 1 2		2300	1			
					1				4		

a) What are the physical address for the following logical address

1952

96

i) 0, 430 ii) 1, 10 iii) 2,500 iv) 3,400 v) 4, 112

4

7M

		UNIT–IV	
7.	a)	Discuss about the different types of file access methods.	7M
	b)	Point out and Explain briefly problems with RAID	7M
		OR	
8.		Let Disk drive 5000 Cylinders from 0 to 4999. Currently drive is at 143rd Cylinder and the previous request was at 125. Queue of pending request in FIFO order is 86,1470,913,1774,948,1509,1022,1750,130. What is total distance the disk arm moves to satisfy all pending request for each of the following scheduling algorithms	
		from current positions i) FCFS ii) SCAN iii) LOOK	14M
		UNIT-V	
9.	a)	What is protection? Distinguish between mechanisms and polices? Explain briefly	014
		Access matrix with domains as objects?	8M
	b)	Explain the different Security Classifications?	6M
		OR	
10.	a)	Describe the goals of protection?	7M
	b)	Explain domain of protection and access matrix	7M
		****	

Hall Ticket Number :													
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## Code: 7GC42

II B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

## **Probability and Statistics**

(Common to CE, ME and CSE)

Max. Marks: 70

### PART-A

Answer the following units by choosing one question from each unit (3 x 14 = 42 Marks)

UNIT-I

1. Given P(A)=1/4, P(B)=1/3 and  $P(A \cup B) = 1/2$ , then evaluate

 $P(A/B), P(B/A), P(A \cap B') \text{ and } P(A'/B')$ 

## OR

2. A random variable *X* has the following probability function values of X.

x:	-2	-1	0	1	2	3
p(x):	0.1	К	0.2	2k	0.3	k

Find the value k,  $P(X \ge -1)$ ,  $P(X \le 2)$ , mean and variance

# UNIT–II

- a) The probability that a pen manufactured by a company will be defective is 1/10. If 12 such pens are manufactured, find the probability that (a) exactly two will defective, (b) at least two will be defective and (c) none will be defective.
  - b) Fit a Poisson distribution to the frequency distribution

X:	0	1	2	3	4	
f:	46	38	22	9	1	
OR						

- 4. a) The weekly wages of workers in a company are normally distributed with mean of Rs. 700 and standard deviation of Rs. 50. Find the probability that the weekly wage of a randomly chosen worker is (i) between Rs. 650 and Rs. 750, and (ii) more than Rs. 750.
  - b) For the normal distribution with mean 2 and standard deviation 4, evaluate (i) P(-6 < x < 3), (ii)  $P\{x \ge 5\}$  and (iii)  $P(\{|x| < 4\})$ .

## UNIT–III

A population consists of the four numbers 3, 7, 11, 15. Consider all possible samples of size 2 which can be drawn with replacement from this population. Find the population mean and standard deviation, and mean and standard deviation of the sampling distribution of means.

14M

R-17

Time: 3 Hours

7M

14M

7M

7M

- 6. a) The standard deviation of the life-times of television tubes manufactured by a company is estimated as 100 hours. Find how large a sample must be taken in order to be 99% confident that the error in the estimated mean life-time will not exceed 20 hours
  - b) Find 95% confidence limits for the mean of a normality distributed population from which the following sample was taken 15,17,10,18,16,9,7,11,13,14.

## UNIT-IV

- 7. a) A sample of 400 items is taken from a population whose standard deviation is
   10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population
  - b) Experience had shown that 20% of a manufactured product is of the top quality. In one day production of 400 articles only 50 are of top quality. Test the hypothesis at 0.05 level

7M

7M

7M

7M

#### OR

8. The mean yield of wheat from a district A was 210 pounds with S.D 2.5 inches per acer from a sample of 100 plots. In another district the mean yield was 220 pounds with S.D 12 pounds from a sample of 150 plots. Assuming that the S.D of yield in the entire state was 11 pounds. Test whether there is any significant difference between the mean yield of crops in the two districts

14M

## UNIT-V

9. In an investigation on the machine performance, the following results are obtained

	No. of units inspected	No. of defectives
Machine I	375	17
Machine II	450	22

Test whether there is any significant performance of two machines at = 0.05 14M

#### OR

10. From the following data, find whether there is any significant liking in the habit of taking soft drinks among the categories of employees

Employees							
Soft Drinks	Clerks	Teachers	Officers				
Pepsi	10	25	65				
Thumsup	15	30	65				
Fanta	50	60	30				
****							

14M

Ha	ll Tie	cket Number :	
Cod	e: 7	G141 R-17	
		B.Tech. II Semester Supplementary Examinations Nov/Dec 2019	
		Computer Organization	
		( Computer Science and Engineering )	
Ма		Time: 3 Hc wer all five units by choosing one question from each unit ( 5 x 14 = 70 Marks )	ours
	7113		
		UNIT–I	
1.	a)	Draw the functional diagram of a computer and explain each block?	7M
	b)	What is bus? Draw the figure to show how functional units are interconnected using	
		a bus and explain it	7M
2.	a)	<b>OR</b> Differentiate between fixed point and floating point representation?	7M
	b)	Explain about signed magnitude approach for representing the fixed point numbers	7M
	,		
3.	a)	What is register transfer language? Explain the basic symbols used in register Transfer	7M
	b)	Discuss about the arithmetic logic shift unit with examples?	7M
1	c)	OR	
4.	a)	What do you mean by Addressing modes? Explain the following addressing modes: i) Index Addressing mode ii) Immediate Addressing mode	
		iii) Relative Addressing mode iv) Direct Addressing mode	7M
	b)	Explain the basic computer instruction formats?	7M
	0)		7 101
5.	a)	Explain Hardwired control unit for simple CPU with diagram	7M
	b)	Explain micro sequencer organization with a neat sketch.	7M
		OR	
6.	a)	What is meant by microprogramming? Explain the micro programmed control?	7M
	b)	Explain about control memory in a micro programmed control organization	7M
7.	a)	<b>UNIT-IV</b> Multiply each of the following pairs of signed 2's complement numbers using booth	
7.	a)	algorithm and bit pairing of the multiplier (Assume A is the Multiplicand and B is	
		the Multiplier).	
		A=010111 B=110110	
		A=110011 B=101100	7M
	b)	Draw and explain the division of floating point numbers	7M
0		OR	
8.	a)	What is virtual memory? With a neat block diagram explain the virtual memory address translation	7M
	b)	What is cache memory? Explain the different mapping functions	7M
	-,		
9.	a)	Draw the block diagram of a DMA controller and explain its functioning?	7M
	b)	Distinguish between Isolated versus Memory Mapped I/O	7M
40	-	OR State and evelopin the different types of because that are securing a ningling	
10.	a) b)	State and explain the different types of hazards that can occur in a pipeline What is data hazard? Explain the methods for dealing with data hazard?	4M 10M
	b)	What is data hazard? Explain the methods for dealing with data hazard?	IUIVI

на	ll Tio	cket Number :	]
Cod	e: 7	G142	
		II B.Tech. II Semester Supplementary Examinations Nov/Dec 2019	
		Design and Analysis of Algorithms	
М	ax.	( Computer Science and Engineering ) Marks: 70 Time: 3	Hours
	Ar	nswer all five units by choosing one question from each unit ( 5 x 14 = 70 Mark	s)
		UNIT–I	
1.	a)	Explain in brief about Asymptotic notations with examples.	7M
	b)	Define Time and Space Complexity, and calculate the time space complexity for	
		addition of two matrices. OR	7M
2.	a)	Develop algorithms for UNION and FIND using weighting rule and collapsing rule	
	,	respectively.	7M
	b)	Derive the time complexity of Binary search.	7M
		UNIT-II	
3.	a)	Use Strassen's algorithm to compute the matrix product $\begin{bmatrix} 3 & 4 \\ 1 & 7 \end{bmatrix} \begin{bmatrix} 8 \\ 6 \end{bmatrix} \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ .	7M
	b)	Write greedy algorithm to the job sequencing with deadlines.	7M
		OR	
4.	a)	Write an algorithm for single source shortest path problem. Explain with example.	7M
	b)	Explain 0/1 Knapsack greedy algorithm with an example.	7M
5.	a)	<b>UNIT–III</b> Explain how to solve Travelling Salesman problem by the method of dynamic	
	- /	programming and analyze the complexity of algorithm.	7M
	b)	Construct an OBST for identifiers(a1,a2, a3,a4)=(do, if, int, while) with	
		P(1:4)=(3,3,1,1) and Q(0:4)=(2,3,1,1,1). OR	7M
6.	a)	Explain the general method of Dynamic Programming.	7M
	b)	Find the optimal solution for the Knapsack instance	
		n=7,M=15(p1,p2,p3,p4,p5,p6,p7)=(10,5,15,7,6,18,3) and	
		(w1,w2,w3,w4,w5,w6,w7)=(2,3,5,7,1,4,1) by using dynamic programming.	7M
7.	a)	<b>UNIT-IV</b> Explain the principle of FIFO branch and bound.	7M
	b)	Solve the following instance of 0/1 knapsack problem using FIFO branch and	
		bound and LC branch and bound.	
		N=4, (p1,p2,p3,p4)=(10,10,12,18), (w1,w2,w3,w4)=(2,4,6,9); M=15.	7M
8.	a)	<b>OR</b> Define n-queens problem. Draw the tree organization of the 4-queens problem.	7M
0.	b)	Explain the Travelling sales person problem LCBB procedure with the following	7 101
	~)	instance and draw the portion of the state space tree and find an optimal tour.	
		20 30 10 11	
		15 16 4 2 3 5 2 4	
		19 6 18 3	
		16 4 7 16	7M
		UNIT–V	
9.	a)	Define P, NP, and NP-Complete problem? Explain.	7M
	b)	Discuss about non-deterministic algorithms.	7M
10.	۹۱	OR Explain the classes of NP-Hard and NP-Complete.	7M
	a) b)	State and prove Cook's theorem.	7M
	~/		