F	Hall Ticket Number :									]				
											R	-20		
Co	o <b>de: 20A533T</b> II B.Tech. I Ser	nester	Reo	ula	r Fxc	amir	natio	ns N	Лаг	ch 20	)22			
		mpute	-							211 20	/			
		( Comn	-								_	_		
Mo	ax. Marks: 70		*	****	****						Time	):3⊦	lou	rs
No	te: 1. Question Paper consistent	sts of tw	vo pa	rts (l	Part	-A ar	nd <b>P</b> a	art-B	<b>B</b> )					
	2. In Part-A, each quest						ъ							
	3. Answer <b>ALL</b> the que	stions 11		rt-A PAR'		Part	-В							
		(Co	- ompu			estior	I)						_	
1.	Answer all the following	g short	ans	wer	que	stio	ns (	5X2=	=10	N)		со		looms ₋evel
a)	Draw the basic function	nal unit	s of	a co	ompi	uter.					(	CO1		L1
b)	Define logic gates.										(	CO2		L1
c)	Define Instruction Form	nat.									(	CO3		L1
d)	Define Memory Access	s Time									(	CO4		L1
e)	What is an I/O Interface	e?									(	CO5	)	L1
			J	PAR'	Т-В									
	Answer <i>five</i> questions by	choosing	g one	que	stion	fron	1 eac	h uni	it ( 5	x 12 =	= 60 Ma	rks )	)	Blooms
											Mark	S	CO	Level
- )	Europeiro the heads and								4 ~ .					
a)	Explain the basic ope				-			-				ΛС	:01	L2
b)	Identify the steps inv					e r′s	cor	nple	me	nt an		1 -		
	(r-1)'s complement w	nth an		•	e.						61	/I C	:01	L1
			OR											
a)			•						-					
	using 2's complemen	•					Ŭ				S 61	Λс	:01	L3
b)	•	•					leci	mal	sys	tem				
	numbers a) 1001011	· · ·									61	Λс	:01	L3
<b>a</b> )	$D$ advice $AD + (AC)^2$	L									<b>CN</b>	1 0		
a)	Reduce AB + (AC)' +		•		,							/ C		
b)	Explain the functiona	lity of a		-	lexe	er.					61	ЛC	:02	L2
			OR											
a)	Simplify the following	expre	ssio	n Y:	=(A-	+ B)	(A ·	+ C')	) (B	+ C'	). 61	ЛC	02	L3
b)	Explain the design of	a 4 bit	bina	ary	cou	nter	wit	h pa	ralle	el loa				
	in detail.										61	ЛC	02	L2
			UNI.											
a)	•	ample	hov	v to	m	ultip	ly 1	WO	uns	signe				
	binary numbers										61	Λс	:03	L2

		<b>746.</b> 20/13331	
b)	Describe the algorithm for integer division with suitable examples.	6M CO3	L2
	OR		
7. a)	Identify the following addressing modes: (i) Relative (ii) Indirect (iii) Auto increment (iv) Direct	6M CO3	L1
b)	Program Control Instructions.	6M CO3	L2
	UNIT–IV		
8. a)	Draw the neat sketch of memory hierarchy and explain the need of cache memory.	6M CO4	L4
b)	What do you mean by virtual memory? Discuss how paging helps in implementing virtual memory.	6M CO4	L1
	OR		
9. a)	Compare and contrast RAM and ROM chips using its		
	structure	6M CO4	L2
b)	Discuss the Memory Hierarchy in computer system with regard to Speed, Size and Cost.	6M CO4	L2
10. a)	What are interrupts? How are they handled?	6M CO5	L1
b)		6M CO5	L1
,	OR		
11. a)	Draw the block diagram of DMA controller	6M CO5	L4
b)	Outline programmed I/O in modes of transfer.	6M CO5	L2

Code: 20A533T

	н	all Ticket Number :			
			R-20		
		ــــا II B.Tech. I Semester Regular Examinations March 2022	)		
		Database Management Systems			
		(Common to CSE and AI&DS)			
	Μ	ax. Marks: 70	lime: 3 l	Hours	
	No	ote: 1. Question Paper consists of two parts ( <b>Part-A</b> and <b>Part-B</b> ) 2. In Part-A, each question carries <b>Two mark.</b>			
		3. Answer ALL the questions in Part-A and Part-B			
		PART-A			
	1	(Compulsory question) (Compulsory question) $(5 \times 2 - 10M)$	со	Bloo	ms
		Answer <b>all</b> the following short answer questions $(5 \times 2 = 10 \text{ M})$		Lev	el
		) Enlist any four features of DBMS.	CO1		
		What is the use of group by clause in SQL?	CO2		
	(C		CO3		
	,	What is 4NF?	CO4		
	e)	List out the states of a transaction	COS	5 L3	
		PART-B Answer <i>five</i> questions by choosing one question from each unit ( 5 x 12 = 60	) Marks	)	
		Answer $five$ questions by choosing one question from each unit ( $3 \times 12 = 0$	Marks	, co	Blooms
		UNIT–I			Level
2	a)	What is Data Abstraction? Explain about different Views of			
	ω)	data?	6M	CO1	L2
	b)	Compare and Contrast file Systems with database systems?	6M	CO1	L3
		OR			
3.	a)	Define Instance and Schema? List different data models and			
		explain?	6M	CO1	L2
	b)	List and Explain extra privileges of Database Administrators	<b>CN</b> 4		
		over Database users?	6M	CO1	L2
Л	a)	<b>UNIT–II</b> Distinguish strong entity set with weak entity set? Draw an			
4.	aj	ER diagram to illustrate week entity set?	7M	CO2	L3
	b)	Explain about different types of integrity constraints?	5M	CO2	L2
	,	OR	••••	002	
5.	a)	Explain the steps for relational database design	5M	CO2	L2
	b)	Draw ER Diagram for Internet shopping.	7M	CO2	 L5
	,				
6.	a)	Write a Syntax for creating a View? Explain Non-Updatable			
		View.	4M	CO3	L3

			Jue: 2	UA3311	
	b)	Consider the following tables:			
		Employee (Emp_no, Name, Emp_city)			
		Company (Emp_no, Company_name, Salary)			
		i. Write a SQL query to display Employee name and company name.			
		ii. Write a SQL query to display employee name,			
		employee city, company name and salary of all the			
		employees whose salary >10000			
		iii. Write a query to display all the employees working in	014		
		"XYZ" company OR	8M	CO3	L5
-	、				
1.	a)	Consider the following relational schema			
		Employee (empno, name, office, age), Books(isbn, title,			
		authors, publisher), Loan(empno, isbn, date)			
		Write the following SQL queries			
		i. Find the names of employees who have borrowed a			
		book Published by McGraw-Hill.			
		ii. Find the names of employees who have borrowed all			
		books Published by McGraw-Hill.			
		iii. Find the names of employees who have borrowed more			
		than five different books published by McGraw-Hill.	8M	CO3	L5
	h)	Differentiate Stored Procedure and Stored Function.	4M	CO3	L3
	0)			003	LJ
-	、			<i>.</i>	
8.	a)	Differentiate BCNF with 3NF.	6M	CO4	L4
	b)	Explain Dependency Preserving Decomposition with a			
		suitable example.	6M	CO4	L4
		OR			
9	a)	If R={ A,B,C,D,E } and FD's F={ $A \rightarrow C$ , $AC \rightarrow D$ , $E \rightarrow AD$ , $E \rightarrow H$ }			
0.	0.)	List all the candidate keys.	7M	CO4	L5
	b)	What is meant by multivalued dependency? Explain with			
	- /	example.	5M	CO4	L4
		UNIT-V	• • • •		
10	<b>2</b> )	What is two-phase locking and how does it guarantee			
10.	a)		614	COF	1.4
		serializability?	OIVI	CO5	L4
	b)	Why concurrency control is needed demonstrate with			
		example.	6M	CO5	L4
		OR			
11.	a)	What are the ACID properties of a transaction? Explain.	6M	CO5	L3
	b)	Discuss about concurrent execution of transactions		CO5	L3
	~)	*** End ***			_0
		LING			

R-20         IBLECH. I Semester Regular Examinations March 2022         Discrete Mathematics (Common to CSE and ABDS)         Max. Marks: 70         Time: 3 Hours         Max. Marks: 70         Time: 3 Hours         Max. Marks: 70         Time: 3 Hours         Mark and Part-A and Part-B PART-A (Computancy question)         1. Answer all the following short answer questions ( $5 X 2 = 10M$ )       CO       Bloom Loss         a) Write each of the following short answer questions of $(x-y)^{10}$ cool       Lass         a) Write each of the following short answer questions of $(x-y)^{10}$ cool       Lass         b) Find the coefficient of $x^4 y^7$ in the expansion of $(x-y)^{10}$ cool       Lass         c) Define POSET. Give suitable example.       cool       Lass         d) What is a arooted tree? Give an example.       cool       Lass         LINIT-I       2. a) Obtain the principle disjunctive normal form of the propositional formula: ( $-P R$ ) $^{A}(Q P)$ .       SM cool       Lass         b) End estatement and explain various connectives with example.       SM cool       Lass         c) Obtain the principle disjunctive normal form of the propositional formula: ( $-P R$ ) $^{A}(Q R) \Leftrightarrow (PVQ) R 5M cool       Lass      <$	Hall	Ticket Number :					
If B.Tech. I Semester Regular Examinations March 2022 Discrete Mathematics (Common to CSE and Al&DS) Max. Marks: 70 Time: 3 Hours Note: 1. Question Paper consists of two parts (Part-A and Part-B) 2. In Part-A, each question carries Two mark. 3. Answer ALL the questions in Part-A and Part-B PART-A (Compulsory question) 1. Answer all the following short answer questions $(5 \times 2 = 10M)$ CO Biomation a) Write each of the following statements in symbolic form. i) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. core to perfine POSET. Give suitable example. core to perfine POSET. Give suitable example. core to perfine POSET. Give suitable example. core to Part-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) Marks CO What is a rooted tree? Give an example. core to Part-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) Marks CO Each CO b) Define statement and explain various connectives with example. core to core the propositional formula: (~P R) ^ (Q P). b) Define statement and explain various connectives with example. SM core to core the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R SM core to the given formula? Find the CNF of ((P Q) ^ -Q) P. SM core to the promute the term or obtain CNF of a given formula? Find the CNF of ((P Q) ^ -Q) P. SM core to the recurrence relation using substitution method. a _= a_{n-1} + 1/n(n+1) where a_{0} = 1. SM core to the following functions SM core to the securence relation a_n - 5a_{n-1} + 6 a_{n-2} = n (n-1) for n 2 by generating functions SM core to the recurrence relation a_n - 5a_{n-1} + 9 a_{n-2} = 0 for n 2, b) Solve the recurrence relation a_n - 6a_{n-1} + 9 a_{n-2} = 0 for n 2, core to the recurrence relation a_n - 6a_{n-1} + 9 a_{n-2} = 0 for n 2, core to the recurrence relation a_n - 6a_{n-1} + 9 a_{n-2} = 0 for n 2, core to the recurrence relation a_n - 6a_{n-1} + 9 a_{n-2} = 0			R-20				
Discrete Mathematics (Common to CSE and AlADS) Max. Marks: 70 Time: 3 Hours Note: 1. Question Paper consists of two parts (Part-A and Part-B) 2. In Part-A, each question carries Two mark. 3. Answer ALL the questions in Part-A and Part-B PART-A (Compulsory question) 1. Answer all the following statements in symbolic form. a) Write each of the following statements in symbolic form. b) Find the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> cos 2 c) Define POSET. Give suitable example. cos 2 c) Define POSET. Give an example. PART-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) Marks co 2 Marks co 2 Marks co 3 co 4 co 4	Code		022				
Max. Marks: 70 Max. Marks: 70 Note: 1. Question Paper consists of two parts (Part-A and Part-B) 2. In Part-A, each question carries Two mark. 3. Answer ALL the questions in Part-A and Part-B PART-A (Compulsory question) 1. Answer all the following statements in symbolic form. 1) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. 1) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. 2) Define POSET. Give suitable example. 3) Write each of the following statements in symbolic form. 3) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. 4) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. 5) Define POSET. Give suitable example. 5) Part-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) 1) Marks co 1) Anil and sunil are price give an example. 5) Part-B 7) Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) 1) Marks co 1) Define statement and explain various connectives with 1) Part b 2. a) Obtain the principle disjunctive normal form of the 1) propositional formula: (~P R) ^ (Q P). 5) Define statement and explain various connectives with 1) example. 1) Corr 3. a) Show that the following statements are logically equivalent 1) without using truth table. (P R) ^ (Q R) ⇔ (PVQ) R 5M corr 1) Marks COP? 4. a) Solve the recurrence relation using substitution method. 1) a n= a_n-1 + 1/ n(n+1) where a_0=1. 5) Solve the recurrence relation using substitution method. 1) a n= a_n-1+3n <sup>2</sup> +3n+1 where a_0=1. 5) Solve the recurrence relation using substitution method. 1) a n= a_n-1+3n <sup>2</sup> +3n+1 where a_0=1. 5) Solve the recurrence relation using substitution method. 1) a n= a_n-1+3n <sup>2</sup> +3n+1 where a_0=1. 5) Solve the recurrence relation using substitution method. 1) a n= a_n-1+3n <sup>2</sup> +3n+1 where a_0=1. 5) Solve the recurrence relation using substitution method. 1) Solve the recurrence relation a_n- 6a_{n-1} + 9a_{n-2} = 0 forn 2,							
Note: 1. Question Paper consists of wo parts ( <b>Part-A</b> and <b>Part-B</b> )       2. In Part-A, each question carries <b>Two mark</b> .         3. Answer <b>ALL</b> the questions in <b>Part-A</b> and <b>Part-B PART-A</b> (Compulsory question)       (Compulsory question)         1. Answer <b>all</b> the following short answer questions $(5 \times 2 = 10M)$ CO         a) Write each of the following statements in symbolic form.       (Compulsory question)         a) Write each of the following statements in symbolic form.       (Compulsory question)         b) Find the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> CO2         c) Define POSET. Give suitable example.       CO4         c) Define POSET. Give suitable example.       CO4         c) What is Hamiltonian path and Hamiltonian circuit? Give suitable example.       CO4         c) What is a rooted tree? Give an example.       CO4         c) What is a rooted tree? Give an example.       CO4         c) What is a rooted tree? Give an example.       CO4         c) What is a rooted tree? Give an example.       CO4         c) What is a rooted tree? Give an example.       CO4         c) What is a the principle disjunctive normal form of the propositional formula: (~P R)^(Q P).       SM co1         c) Define statement and explain various connectives with example.       SM co1         c) What is CNF? Explain the procedure to obtain CNF of a given formula							
Note: 1. Question Paper consists of two parts ( <b>Part-A</b> and <b>Part-B</b> )       2. In Part-A, each question carries <b>Two mark</b> .         3. Answer <b>ALL</b> the questions in <b>Part-A</b> and <b>Part-B PART-A</b> (Compulsory question)       1. Answer <b>all</b> the following statements in symbolic form.       0         a) Write each of the following statements in symbolic form.       0.1       Control the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> Col         b) Find the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> Col       Col       Col         c) Define POSET. Give suitable example.       Col       Col       Col         c) What is Hamiltonian path and Hamiltonian circuit? Give suitable example.       Col       Col       Col         c) What is a rooted tree? Give an example.       Col       Col       Eloc         c) What is a rooted tree? Give an example.       Col       Col       Eloc         c) What is a rooted tree? Give an example.       Col       Col       Eloc         c) What is a rooted tree? Give an example.       Col       Col       Eloc         c) What is a rooted tree? Give an example.       Col       Col       Eloc         c) What is a rooted tree? Give an example.       Col       Col       Eloc         c) What is a col the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P).	Max		Time: 3	Hours	i		
2. In Part-A, each question carries <b>Two mark.</b> 3. Answer <b>ALL</b> the questions in <b>Part-A</b> and <b>Part-B</b> <b>PART-A</b> (Compulsory question) 1. Answer <i>all</i> the following statements in symbolic form. a) Write each of the following statements in symbolic form. b) Find the coefficient of $x^4 y^7$ in the expansion of $(x-y)^{10}$ core core <b>Define</b> POSET. Give suitable example. core <b>PART-B</b> <b>Answer five</b> questions by choosing one question from each unit ( $5 \times 12 = 60$ Marks) <b>PART-B</b> <b>Answer five</b> questions by choosing one question from each unit ( $5 \times 12 = 60$ Marks) <b>Define</b> statement and explain various connectives with example. <b>Core</b> <b>3.</b> a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M core <b>Define</b> formulae? Find the CNF of ((P Q) ^ ~Q) P. <b>Define</b> formulae? Find the CNF of ((P Q) ^ ~Q) P. <b>Solve</b> the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ . <b>Answer Solve</b> the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . <b>Bolor</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Core</b> <b>Co</b>	Note:						
3. Answer ALL the questions in Part-A and Part-B <u>PART-A</u> (Compulsory question) 1. Answer all the following short answer questions $(5 \times 2 = 10 \text{ M})$ CO a) Write each of the following statements in symbolic form. i) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. co1 true b) Find the coefficient of x 4 y 7 in the expansion of (x-y) <sup>10</sup> co2 to c) Define POSET. Give suitable example. co3 to d) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. co4 to PART-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) Marks co UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P). b) Define statement and explain various connectives with example. CO a) Cor a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) ⇔ (PVQ) R 5M co1 to UNIT-II 4. a) Solve the recurrence relation using substitution method. a n= an-1 + 1/ n(n+1) where ao=1. SM co2 to COR 5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1. SM co2 to COR 5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1. SM co2 to COR 5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1. b) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1. b) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1. b) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1. b) Solve the recurrence relation an- 6a n-1 + 9a n-2 = 0 for n 2, cor and cor an							
(Compulsory question)1. Answer all the following short answer questions $(5 \times 2 = 10M)$ COBlocma) Write each of the following statements in symbolic form.i) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich.Co1Lib) Find the coefficient of $x^4 y^7$ in the expansion of $(x-y)^{10}$ Co2Lic) Define POSET. Give suitable example.Co3Lid) What is Hamiltonian path and Hamiltonian circuit? Give suitable example.Co4Lie) What is a rooted tree? Give an example.Co6Iiie) What is a rooted tree? Give an example.SMCo1Iiie) Obtain the principle disjunctive normal form of the propositional formula: (-P R)^(Q P).SMCo1Iiib) Define statement and explain various connectives wit		3. Answer ALL the questions in Part-A and Part-B					
1. Answer <i>all</i> the following short answer questions $(5 \times 2 = 10M)$ CO a) Write each of the following statements in symbolic form. i) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. b) Find the coefficient of $x^4 y^7$ in the expansion of $(x-y)^{10}$ Co2 12 c) Define POSET. Give suitable example. c) Uhit is Hamiltonian path and Hamiltonian circuit? Give suitable example. c) What is a rooted tree? Give an example. c) What is a rooted tree? Give an example. c) What is a rooted tree? Give an example. c) UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: (-P R) ^ (Q P). b) Define statement and explain various connectives with example. CO1 L c) CO2 d) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. b) Solve the recurrence relation using substitution method. a n = an + 1 / n (n+1) where ao=1. c) CO2 c) CO2 c) CO2 c) CO2 c) CO2 c) CO2 c) CO3 c) CO3 c							
a) Write each of the following statements in symbolic form. i) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. b) Find the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> c) Define POSET. Give suitable example. c) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. c) What is a rooted tree? Give an example. c) What is compositional formula: (~P R) ^ (Q P). b) Define statement and explain various connectives with example. c) OR 3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M cori c) UNIT-II 4. a) Solve the recurrence relation using substitution method. a <sub>n</sub> = a <sub>n-1</sub> + 1/ n(n+1) where a <sub>0</sub> =1. b) Solve the recurrence relation using substitution method. a <sub>n</sub> = a <sub>n-1</sub> + 3n <sup>2</sup> + 3n + 1 where a <sub>0</sub> =1. c) M co2 c) CR 5. a) Solve the recurrence relation using substitution method. a <sub>n</sub> = a <sub>n-1</sub> + 3n <sup>2</sup> + 3n + 1 where a <sub>0</sub> =1. b) Solve the recurrence relation using substitution method. a <sub>n</sub> = a <sub>n-1</sub> + 3n <sup>2</sup> + 3n + 1 where a <sub>0</sub> =1. b) Solve the recurrence relation using substitution method. a <sub>n</sub> = a <sub>n-1</sub> + 3n <sup>2</sup> + 3n + 1 where a <sub>0</sub> =1. c) M co2 c) L b) Solve the recurrence relation using substitution method. a <sub>n</sub> = a <sub>n-1</sub> + 3n <sup>2</sup> + 3n + 1 where a <sub>0</sub> =1. c) M co2 c) L c) Solve the recurrence relation a <sub>n</sub> - 6a <sub>n-1</sub> + 9a <sub>n-2</sub> = 0 for n 2, c) C)	4 0.00		N	~~	Blooms		
i) Anil and sunil are rich. ii) It is not true that ravi and raju are both rich. Col 1.1 b) Find the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> Co2 1.3 c) Define POSET. Give suitable example. Co3 1.1 d) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. Co4 1.2 PART-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks) Marks CO <sup>Bloon</sup> UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P). 5M Co1 1.2 b) Define statement and explain various connectives with example. 5M Co1 1.2 CO1 1.2 Bloon UNIT-I 3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M Co1 1.2 D) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M Co1 1.2 UNIT-II 4. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ . 5M Co2 1.2 D) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M Co2 1.2 D) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M Co2 1.2 D) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M Co2 1.2 D) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 1.2 D) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 1.2 D) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 1.2 D) Solve the recurrence relation a_n 6a_{n-1} + 9a_{n-2} = 0 for n 2,			)	CO	Level		
b) Find the coefficient of x <sup>4</sup> y <sup>7</sup> in the expansion of (x-y) <sup>10</sup> co2 13 c) Define POSET. Give suitable example. co3 14 d) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. co4 12 e) What is a rooted tree? Give an example. co4 12 PART-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks ) Marks co UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P). 5M co1 L b) Define statement and explain various connectives with example. 5M co1 L OR 3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M co1 L UNIT-II 4. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0=1$ . 5M co2 L b) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0=1$ . 5M co2 L <b>OR</b> 5. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0=1$ . 5M co2 L b) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0=1$ . 5M co2 L <b>OR</b>				004			
c) Define POSET. Give suitable example. d) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. e) What is a rooted tree? Give an example. PART-B Answer five questions by choosing one question from each unit ( $5 \times 12 = 60$ Marks) Marks CO UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: ( $-P \ R$ ) ^ (Q P). b) Define statement and explain various connectives with example. SM Co1 CO1 b) Define statement and explain various connectives with example. SM Co1 b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ -Q) P. Marks CO1 L Marks CO1 L CO2 CO2 L Marks CO1 CO3 CO3 CO3 CO3 CO3 CO3 CO3 CO3			•				
d) What is Hamiltonian path and Hamiltonian circuit? Give suitable example. CO4 L2 e) What is a rooted tree? Give an example. CO4 L2 PART-B Answer five questions by choosing one question from each unit ( $5 \times 12 = 60$ Marks) Marks CO Bloom Leve LUNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: ( $-P R$ ) $\wedge$ (Q P). 5M CO1 L b) Define statement and explain various connectives with example. 5M CO1 L COR 3. a) Show that the following statements are logically equivalent without using truth table. ( $P R$ ) $\wedge$ (Q R) $\Leftrightarrow$ (PVQ) R 5M CO1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of (( $P Q$ ) $\wedge -Q$ ) P. 5M CO1 L LINIT-II 4. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for n 2 by generating functions 5M CO2 L COR 5. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L COR 5. a) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for n 2,				CO2	L3		
e) What is a rooted tree? Give an example. CO4 L2 PART-B Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks ) Marks CO Bloom Leve UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: $(-P R) \land (Q P)$ . 5M Co1 L b) Define statement and explain various connectives with example. 5M Co1 L OR 3. a) Show that the following statements are logically equivalent without using truth table. $(P R) \land (Q R) \Leftrightarrow (PVQ) R$ 5M Co1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of $((P Q) \land -Q) P$ . 5M Co1 L UNIT-II 4. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0=1$ . 5M Co2 L b) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for n 2 by generating functions 5M Co2 L CR 5. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1}+3n^2+3n+1$ where $a_0=1$ . 5M Co2 L b) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for n 2,				CO3	L1		
PART-B         Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks )         Marks CO       Bloom         UNIT-I         2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P).       5M co1       L         b) Define statement and explain various connectives with example.       5M co1       L         OR         3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1       L         Define statement and explain various connectives with example.         OR         3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1       L         Define statement and explain various connectives with example.         OR         3. Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1       L         UNIT-II         4. a) Solve the recurrence relation using substitution method.         a n= a n=1 + 1/ n(n+1) where ao=1.       5M co2       L         OR         5. a) Solve the recurrence relation using substitution method. <td <="" colspan="2" td=""><td>d) What</td><td>at is Hamiltonian path and Hamiltonian circuit? Give suitable exa</td><td>ample.</td><td>CO4</td><td>L2</td></td>	<td>d) What</td> <td>at is Hamiltonian path and Hamiltonian circuit? Give suitable exa</td> <td>ample.</td> <td>CO4</td> <td>L2</td>		d) What	at is Hamiltonian path and Hamiltonian circuit? Give suitable exa	ample.	CO4	L2
Answer five questions by choosing one question from each unit (5 x 12 = 60 Marks ) Marks CO Bloom Leve UNIT-I 2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P). 5M Co1 L b) Define statement and explain various connectives with example. 5M Co1 L OR 3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M Co1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M Co1 L UNIT-II 4. a) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ . 5M Co2 L b) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for n 2 by generating functions 5M Co2 L COR 5. a) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^{2} + 3n + 1$ where $a_0 = 1$ . 5M Co2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^{2} + 3n + 1$ where $a_0 = 1$ . 5M Co2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^{2} + 3n + 1$ where $a_0 = 1$ . 5M Co2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^{2} + 3n + 1$ where $a_0 = 1$ . 5M Co2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^{2} + 3n + 1$ where $a_{0} = 1$ . 5M Co2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^{2} + 3n + 1$ where $a_{0} = 1$ . 5M Co2 L	e) Wh	at is a rooted tree? Give an example.		CO4	L2		
UNIT-I2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P).5M co1b) Define statement and explain various connectives with example.5M co1c) Define statement and explain various connectives with example.5M co1b) Define statement and explain various connectives with example.5M co1c) Define statement and explain various connectives with example.5M co1b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ Q) P.5M co2c) UNIT-II5M co2L4. a) Solve the recurrence relation using substitution method. a n= a n-1 + 1/ n(n+1) where ao=1.5M co2c) Define statement erelation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where ao=1.5M co2c) Define statement erelation an- 6a n-1 + 9 a n-2 = 0 for n 2,c) Solve the recurrence relation an- 6a n-1 + 9 a n-2 = 0 for n 2,							
UNIT-I         2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P).       5M co1       L         b) Define statement and explain various connectives with example.       5M co1       L         OR         3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) ⇔ (PVQ) R       5M co1       L         b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P.       5M co1       L         LUNIT-II         4. a) Solve the recurrence relation using substitution method. a n= an-1 + 1/ n(n+1) where a0=1.       5M co2       L         OR         5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where a0=1.       5M co2       L         D         Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where a0=1.       5M co2       L         D         Solve the recurrence relation using substitution method. a n= a n-1+3n <sup>2</sup> +3n+1 where a0=1.       5M co2       L         D         Solve the recurrence relation an- 6a n-1 + 9 a n-2 = 0 for n       2,	An	swer <i>five</i> questions by choosing one question from each unit ( 5 x	12 = 60 Mai	'ks)	Pleam		
<ul> <li>2. a) Obtain the principle disjunctive normal form of the propositional formula: (~P R) ^ (Q P). 5M CO1 L</li> <li>b) Define statement and explain various connectives with example. 5M CO1 L</li> <li>OR</li> <li>3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) ⇔ (PVQ) R 5M CO1 L</li> <li>b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M CO1 L</li> <li>UNIT-II</li> <li>4. a) Solve the recurrence relation using substitution method. a n= an-1 + 1/ n(n+1) where ao=1. 5M CO2 L</li> <li>b) Solve the recurrence relation an- 5an-1 + 6 an-2 = n (n-1) for n 2 by generating functions 5M CO2 L</li> <li>OR</li> <li>5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n<sup>2</sup>+3n+1 where ao=1. 5M CO2 L</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2=0 for n 2, 5M CO2 L</li> </ul>			Marks	CO			
propositional formula: $(\ensuremath{\sim} P \ R) \land (Q \ P)$ . b) Define statement and explain various connectives with example. <b>OR</b> 3. a) Show that the following statements are logically equivalent without using truth table. $(P \ R) \land (Q \ R) \Leftrightarrow (PVQ) \ R$ 5M CO1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of $((P \ Q) \land \sim Q) \ P$ . 5M CO1 L <b>UNIT-II</b> 4. a) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for n 2 by generating functions 5M CO2 L <b>OR</b> 5. a) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L							
<ul> <li>b) Define statement and explain various connectives with example.</li> <li>SM CO1 L</li> <li>OR</li> <li>a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) ⇔ (PVQ) R 5M CO1 L</li> <li>b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M CO1 L</li> <li>UNIT-II</li> <li>4. a) Solve the recurrence relation using substitution method. a n= an-1 + 1/ n(n+1) where ao=1. 5M CO2 L</li> <li>b) Solve the recurrence relation an- 5an-1 + 6 an-2 = n (n-1) for n 2 by generating functions 5M CO2 L</li> <li>OR</li> <li>5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n<sup>2</sup>+3n+1 where ao=1. 5M CO2 L</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2=0 for n 2,</li> </ul>	2. a) <b>(</b>	Obtain the principle disjunctive normal form of the					
example. <b>OR</b> 3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M CO1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M CO1 L <b>UNIT-II</b> 4. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for n 2 by generating functions 5M CO2 L <b>OR</b> 5. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . 5M CO2 L b) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for n 2,	р	propositional formula: (~P R) ^ (Q P).	5M	CO1	L		
OR3. a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P.5M co14. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ .5M co2b) Solve the recurrence relation $a_n$ - $5a_{n-1} + 6 a_{n-2} = n (n-1)$ for n 2 by generating functions5M co2corrcorrb) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ .5M co2corrcorrb) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ .5M co2corrco	b) [	Define statement and explain various connectives	with				
<ul> <li>a) Show that the following statements are logically equivalent without using truth table. (P R) ^ (Q R) ⇔ (PVQ) R 5M CO1 L</li> <li>b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M CO1 L</li> <li><b>UNIT-II</b></li> <li>4. a) Solve the recurrence relation using substitution method. a n = an-1 + 1/ n(n+1) where ao=1. 5M CO2 L</li> <li>b) Solve the recurrence relation an- 5an-1 + 6 an-2 = n (n-1) for n 2 by generating functions 5M CO2 L</li> <li><b>OR</b></li> <li>5. a) Solve the recurrence relation using substitution method. a n = a n-1+3n<sup>2</sup>+3n+1 where ao=1. 5M CO2 L</li> <li>b) Solve the recurrence relation using substitution method. a n = a n-1+3n<sup>2</sup>+3n+1 where ao=1. 5M CO2 L</li> </ul>	e	example.	5M	CO1	L		
without using truth table. (P R) $\land$ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1 L b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) $\land \sim$ Q) P. 5M co1 L UNIT-II 4. a) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+1/n(n+1)$ where $a_{0}=1$ . 5M co2 L b) Solve the recurrence relation $a_{n}-5a_{n-1}+6a_{n-2}=n(n-1)$ for n 2 by generating functions 5M co2 L OR 5. a) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+3n^{2}+3n+1$ where $a_{0}=1$ . 5M co2 L b) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+3n^{2}+3n+1$ where $a_{0}=1$ . 5M co2 L b) Solve the recurrence relation $a_{n}-6a_{n-1}+9a_{n-2}=0$ for n 2,		OR					
without using truth table. (P R) $\land$ (Q R) $\Leftrightarrow$ (PVQ) R 5M co1 Li b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) $\land \sim$ Q) P. 5M co1 Li UNIT-II 4. a) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+1/n(n+1)$ where $a_{0}=1$ . 5M co2 Li b) Solve the recurrence relation $a_{n}-5a_{n-1}+6a_{n-2}=n(n-1)$ for n 2 by generating functions 5M co2 Li OR 5. a) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+3n^{2}+3n+1$ where $a_{0}=1$ . 5M co2 Li b) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+3n^{2}+3n+1$ where $a_{0}=1$ . 5M co2 Li b) Solve the recurrence relation $a_{n}-6a_{n-1}+9a_{n-2}=0$ for n 2,	3. a) S	Show that the following statements are logically equiva	lent				
<ul> <li>b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of ((P Q) ^ ~Q) P. 5M CO1 L. UNIT-II</li> <li>4. a) Solve the recurrence relation using substitution method. a n= an-1 + 1/ n(n+1) where ao=1. 5M CO2 L.</li> <li>b) Solve the recurrence relation an- 5an-1 + 6 an-2 = n (n-1) for n 2 by generating functions 5M CO2 L.</li> <li>5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n<sup>2</sup>+3n+1 where ao=1. 5M CO2 L.</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2 = 0 for n 2, 5M CO2 L.</li> </ul>				CO1	1		
<ul> <li>given formulae? Find the CNF of ((P Q) ^~Q) P. 5M co1 Line</li> <li>4. a) Solve the recurrence relation using substitution method. a n = an-1 + 1/ n(n+1) where a0=1. 5M co2 Line</li> <li>b) Solve the recurrence relation an- 5an-1 + 6 an-2 = n (n-1) for n 2 by generating functions 5M co2 Line</li> <li>5. a) Solve the recurrence relation using substitution method. a n = a n-1+3n<sup>2</sup>+3n+1 where a0=1. 5M co2 Line</li> <li>b) Solve the recurrence relation using substitution method. a n = a n-1+3n<sup>2</sup>+3n+1 where a0=1. 5M co2 Line</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2 = 0 for n 2, 5M co2 Line</li> </ul>			•	001	-		
UNIT-II4. a) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 1/n(n+1)$ where $a_{0}=1$ .5M co2b) Solve the recurrence relation $a_{n}-5a_{n-1}+6a_{n-2}=n(n-1)$ for n 2 by generating functions5M co2OR5. a) Solve the recurrence relation using substitution method. $a_{n}=a_{n-1}+3n^{2}+3n+1$ where $a_{0}=1$ .5M co2b) Solve the recurrence relation $a_{n}-6a_{n-1}+9a_{n-2}=0$ for n2,		· · ·	5M	CO1			
4. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 1/n(n+1)$ where $a_0 = 1$ .5M CO2 Lb) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for n 2 by generating functions5M CO2 LOR5. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ .5M CO2 Lb) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for n2,	9		JIVI	COT	L		
b) Solve the recurrence relation using substitution method. $a_{n} = a_{n-1} + 1/n(n+1)$ where $a_{0}=1$ . $b)$ Solve the recurrence relation $a_{n}-5a_{n-1}+6a_{n-2} = n(n-1)$ for n 2 by generating functions $5M \ CO2 \ L$ OR $5M \ CO2 \ L$ $CO2 \ L$ $a_{n} = a_{n-1}+3n^{2}+3n+1$ where $a_{0}=1$ . $5M \ CO2 \ L$ $5M \ CO2 \ L$ $b)$ Solve the recurrence relation $a_{n}-6a_{n-1}+9a_{n-2}=0$ for n 2,	4 a) C						
<ul> <li>b) Solve the recurrence relation an- 5an-1 + 6 an-2 = n (n-1) for n 2 by generating functions 5M CO2 La OR</li> <li>5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n<sup>2</sup>+3n+1 where a0=1. 5M CO2 La</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2 = 0 for n 2,</li> </ul>	4. a) C	6	- 14				
2 by generating functions <b>OR</b> 5. a) Solve the recurrence relation using substitution method. $a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ . b) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for n 2,				CO2	L		
<ul> <li>OR</li> <li>5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n<sup>2</sup>+3n+1 where a0=1. 5M CO2 L</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2 =0 for n 2,</li> </ul>			n				
<ul> <li>5. a) Solve the recurrence relation using substitution method. a n= a n-1+3n<sup>2</sup>+3n+1 where a0=1.</li> <li>b) Solve the recurrence relation an- 6a n-1 + 9 a n-2 =0 for n 2,</li> </ul>	2	by generating functions	5M	CO2	L		
a $_{n}$ = a $_{n-1}$ + 3n <sup>2</sup> + 3n + 1 where $a_0$ = 1. 5M co2 L b) Solve the recurrence relation $a_n$ - 6a $_{n-1}$ + 9 a $_{n-2}$ = 0 for n 2,		OR					
a $_{n}$ = a $_{n-1}$ +3n <sup>2</sup> +3n+1 where a <sub>0</sub> =1. 5M co <sub>2</sub> L b) Solve the recurrence relation a <sub>n</sub> - 6a $_{n-1}$ + 9 a $_{n-2}$ =0 for n 2,	5. a) S	Solve the recurrence relation using substitution method.					
		$a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0 = 1$ .	5M	CO2	L		
	b) S	Solve the recurrence relation $a_n$ - 6a $n_{-1}$ + 9 a $n_{-2}$ =0 for n 2	2,				
				COS	I		
	3		0.11	502			

Page **1** of **2** 

		Co	ode: 20	AC33T	
•	,	UNIT-III			
6.	a)	Establish the following relation in Boolean algebra:			
	b)	$(a + b) (b + c) + b \cdot (a + c) = a \cdot b + a \cdot c + b$		CO3	L2
	b)	Describe semi groups and monoids. OR	5M	CO3	L4
7.	a)	Define compatibility relation. Find the maximum compatibility block in the given relation. X= {(ball, bed, dog, let, egg)} and the relation is given as			
		$R=\{(x, y)/x, y X \land x R y \text{ if } x \text{ and } y \text{ contains some common} \\ letter.$	5M	000	L3
	b)	Given the relation matrix $M_{\rm I}$ of a relation R, $M_{\rm R} \begin{bmatrix} 1 & 0 & 1^{\rm ltion} \ R, \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$	3101	CO3	L3
		Find the matrices of $R^2 = R \circ R, R^3 = R \circ R \circ R$ . UNIT–IV	5M	CO3	L3
8.	a)	Explain Euler's theorem with an example.	5M	CO4	L2
	b)	If G is a non directed graph with 12 edges. Suppose that G has 6 vertices of degree 3 and the rest have degree less than			
		3.Determine the minimum number of vertices.	5M	CO4	L3
9.	a)	OR Prove that the sum of degrees formed by a planar representation of a connected graph G with e edges equals 2e.		CO4	L4
	b)	What is Isomorphism? Give a suitable example to show the steps in detail that the two graphs are Isomorphic in nature.		CO4	L2
10.	a)	Explain kruskal's algorithm and using the same obtain the minimal spanning tree for the following weighted graph.			
		$v_2 \qquad 3 \qquad v_4$			
		$v_1$ $v_6$ $v_6$ $v_6$			
		$v_3$ 6 $v_5$	7M	CO5	L3
	b)	What is meant by Pendant Vertices? Explain. <b>OR</b>	3M	CO5	L2
11.	a)	Exemplify rooted and binary trees.	5M	CO5	L2
	b)	Show that in a tree, the number of vertices is one more than			
		the number of edges. *** End ***	5M	CO5	L4
			Pa	ze <b>2</b> of <b>2</b>	

Ha	Il Ticket Number :			
Coc	de: 20AC35T	R-	·20	
	II B.Tech. I Semester Regular Examinations March 20 <b>Management Science</b> ( Common to CSE and AI&DS )	22		
Ma	x. Marks: 70	Time:	: 3 Hc	ours
Note	<ul> <li>e: 1. Question Paper consists of two parts (Part-A and Part-B)</li> <li>2. In Part-A, each question carries Two mark.</li> <li>3. Answer ALL the questions in Part-A and Part-B</li> </ul> <u>PART-A</u> (Compulsory question)			
1.	Answer <b>all</b> the following short answer questions (5 X 2 = 10N	1) C	()	Blooms Level
a) W	hy is management considered as a science?	C	<b>D</b> 1	L2
b) W	hat is employee job evaluation?	C	<b>)</b> 2	L2
c) Ju	st-in-Time Inventory	C	<b>D</b> 3	L2
d) Pı	rofit vs Wealth maximization.	C	<b>)</b> 4	L2
e) Ba	ases of Market Segmentation	C	<b>)</b> 5	L2
	PART-B			
Α	nswer <i>five</i> questions by choosing one question from each unit (5 x 1	2 = 60 I	Marks	-
		Marks	CO	Blooms Level
	UNIT–I			
2.	Outline Fayol's 14 principles of management and explain their relevance in managerial theory.	12M	CO1	L3
	OR			
3.	What do you mean by organization structure? Briefly explain different forms of organizational structure.	12M	CO1	L3
4.	Discuss in detail the various functions of Human Resource Management in an IT firm.	12M	CO2	2 L4
_	OR de la construcción de la cons			
5.	Briefly discuss various training methods used in organizations, especially in a manufacturing concern.	12M	CO2	2 L4
	UNIT–III			
6.	Write a detailed note on the various factors affecting plant location.	12M	CO3	5 L3
	OR			

		Code: 2	20AC35T	
7. a)	What is network analysis?	6M	CO3	L2
b)	Relate the importance of Project evaluation and review technique.	6M	CO3	L3
8.	Explain how financial management is important in performing organizational tasks. OR	12M	CO4	L3
9. a)	What are the advantages of Pay-back period?	6M	CO4	L2
b)	Explain in detail about the various sources of finance.	6M	CO4	L4
10.	Why is marketing important and describe the various roles and functions of marketing channels? <b>OR</b>	12M	CO5	L3
11.	Illustrate the various stages in product life cycle? *** End ***	12M	CO5	L3

Hall Ticket Number :	[		
Code: 20A532T	R	-20	
II B.Tech. I Semester Regular Examinations March 20	22		
<b>Object Oriented Programming using Java</b> ( Common to CSE and AI&DS )			
Max. Marks: 70	Time	: 3 Hc	ours
Note: 1. Question Paper consists of two parts ( <b>Part-A</b> and <b>Part-B</b> )			
<ol> <li>In Part-A, each question carries Two mark.</li> <li>Answer ALL the questions in Part-A and Part-B</li> </ol>			
<u>PART-A</u> (Compulsory question)			
1. Answer <b>all</b> the following short answer questions $(5 \times 2 = 10 \times 10^{10} \times 10^{10}$	Л) (	co <sup>e</sup>	Blooms Level
a) What gets printed when the following program is compiled	d		LOVOI
and run.			
class test {			
<pre>public static void main(String args[]) {</pre>			
int i, j, k, l=0;			
k = l++;			
j = ++k;			
i = j++;			
System.out.println(i);			
}			
}		1	L3
<ul> <li>b) Explain method overriding.</li> <li>c) Define interface</li> </ul>		2	L2
c) Define interface.		3	L1
d) What is the purpose of multithreaded programming?		4	L2
e) List the importance of List interface. PART-B		5	L1
Answer five questions by choosing one question from each unit ( 5 x 1	2 = 60	Marks	;)
	Marks	со	Blooms
UNIT–I			Level
a) Explain method overloading with an example.	6M	1	L2
b) Write a Java program to display Fibonacci series	6M	1	L1
between 1 to n.			
OR			
a) Explain the constructor with an example.	6M	1	L2
b) List the different operators in java. Explain	6M	1	L1

		Code:	20A532	21
	UNIT–II			
4. a)	How can you achieve multilevel inheritance? Explain.	6M	2	L3
b)	Explain about inner class.	6M	2	L2
	OR			
5. a)	Write a java program to check whether string is palindrome or not	6M	2	L1
b)	Define inheritance. What is method overriding in inheritance? Explain	6M	2	L2
	UNIT–III			
6. a)	Define package. How can you create user defined package? Explain with an example.	6M	3	L2
b)	How can you create your own exception? Explain.	6M	3	L3
	OR			
7. a)	What is an exception? Explain different types of exception handling keywords in java.	6M	3	L2
b)	How to extend interfaces in java? Explain with an example.	6M	3	L3
	UNIT–IV			
8. a)	Write a Java program for multi-thread implementation.	6M	4	L2
b)	Explain Generic interfaces with example.	6M	4	L2
	OR			
9. a)	Explain synchronization with an example.	6M	4	L2
b)	What are generics? Explain bounded types in generics with example.	6M	4	L2
	UNIT–V			
10. a)	Explain about LinkedList class in java with an example.	6M	5	L2
b)	Explain Generic Functional Interfaces with example.	6M	5	L2
	OR			
11. a)	Define Lambda expression. Explain block lambda expressions with an example.	6M	5	L2
b)	Explain about ArrayList class in java. *** End ***	6M	5	L2