Hall Ticket Number :										

R-20

Code: 20AC33T

II B.Tech. I Semester Regular & Supplementary Examinations February 2023

Discrete Mathematics

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

			CO	BL
1.	Answer ***all*** the following short answer questions	(5 X 2 = 10M)		
a)	Define Conjuntive Normal Form?		1	L1
b)	List out methods for solving recurrence relations?		2	L1
c)	Define Hassae diagram? How this is differenet from relation diagrams?		3	L2
d)	Diferentiate walk and path with examples?		4	L2
e)	List out applications of Trees?		5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.	a)	Show that $((P \rightarrow Q) \wedge (Q \rightarrow R)) \leftrightarrow ((P \vee Q) \rightarrow R)$?	6M	CO1	1
	b)	Find the Principle Disjunctive Normal Form (PDNF) for $(P \wedge \sim Q) \vee (P \wedge \sim R) \wedge (Q \wedge R)$	6M	CO1	2
		OR			
3.	a)	Define proposition and connectives? Prove that. $(P \vee Q) \rightarrow (P \wedge Q)$ is logically equivalent to $P \leftrightarrow Q$?	6M	CO1	1
	b)	Explain automatic theorem proving with example?	6M	CO1	1
		UNIT–II			
4.	a)	Define generating functions? How a recurrence relation is solved with generating function method?	4M	CO2	1
	b)	Solve the recurrence relation by the method of generating function $a_n - 9a_{n-1} + 20a_{n-2} = 0$, $a_0 = -3$, $a_1 = 1$	8M	CO2	2
		OR			
5.	a)	What are non-homogeneous recurrence relations? How these are solved?	4M	CO2	1
	b)	Find all solutions of the Recurrence relation $a_n = 5a_{n-1} - 6a_{n-2} + 7^n$	8M	CO2	2

UNIT–III

6. a) Let A= {1,2,3,4,5,6} and let R be the relation x divides y. (i) Write R as a set of ordered pairs (ii) Draw its directed graph — 6M CO3 2

   b) Draw the Hassae diagram representing the Partial ordering {(a,b) | a divides b} on a set of { 1,2,3,4,6,8,12} — 6M CO3 2

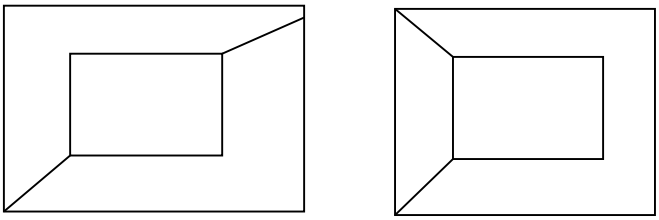
OR

7. a) List out the properties of groups with an example? — 6M CO3 1

   b) What is group? Show that set of rational numbers Q forms a group under the binary operation * defined by a*b=a+b-a*b, ? a,b∈Q. — 6M CO3 2

UNIT–IV

8. The following graphs are isomorphic or not?



12M CO4 2

OR

9. a) Draw the complete graph ***K*5** with vertices ***A, B, C, D, E***. Draw all complete sub graph of ***K*5** with 4 vertices? — 6M CO4 2

   b) Give short notes on i) Connected graphs ii) Sub graphs iii) disconnected graphs — 6M CO4 1

UNIT–V

10. a) A tree has two vertices of degree 2, one vertex of degree 3 and three vertices of degree 4. How many vertices of degree 1 does it have? — 6M CO5 2

    b) Define tree and its properties? Illustrate the Kruskal's algorithm? — 6M CO5 1

OR

11. a) Prove that a binary tree with n nodes has exactly (n - 1) edges? — 6M CO5 2

    b) Give short notes on spanning trees? — 6M CO5 1

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC35T

II B.Tech. I Semester Regular & Supplementary Examinations February 2023

Management Science

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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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)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Define Organisation.	1	L1
b)	Define Human Resource Management.	2	L1
c)	What is Batch production?	3	L1
d)	Define Financial Management.	4	L1
e)	Explain about Marketing Mix.	5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2.	Explain about Fayol`s Administrative management.	12M	1	L3
	OR			
3.	Explain about staff organization structure with its merits and demerits.	12M	1	L3
	UNIT–II			
4.	Explain the significance and functions of Human Resource Management.	12M	2	L3
	OR			
5.	Explain the importance and process of Recruitment.	12M	2	L4
	UNIT–III			
6.	Explain the factors influencing the selection of a Plant Location.	12M	3	L4
	OR			
7.	Explain about PERT and CPM techniques in project evaluation.	12M	3	L4
	UNIT–IV			
8.	What is working capital? Explain the importance of working capital.	12M	4	L3
	OR			
9.	Explain various sources of finance.	12M	4	L3
	UNIT–V			
10.	Comment on different pricing methods used in Marketing.	12M	5	L5
	OR			
11.	Explain the role of marketing channels in case of FMCG products.	12M	5	L5

*** End ***

Hall Ticket Number :										

R-20

Code: 20A532T

II B.Tech. I Semester Regular & Supplementary Examinations February 2023

Object Oriented Programming using Java

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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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)

			CO	BL
1.	Answer ***all*** the following short answer questions	(5 X 2 = 10M)		
a)	What are the primitive data types in java? List them.		1	L1
b)	How to declare an array 'p' to store 50 float elements?		2	L2
c)	What is an exception in java? Give an example.		3	L1
d)	List any four methods from Thread class.		4	L2
e)	What is difference between Array and ArrayList?		5	L3

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT–I			
2.	a)	Explain all OOPS concepts	5M	1	L1
	b)	Explain constructor overloading and method overloading with an example program	7M	1	L2
		OR			
3.		Define classes and objects? Explain its operation with an example program	12M	1	L2
		UNIT–II			
4.	a)	Write a program to find the sum two given matrices using arrays. $A=\begin{bmatrix} 4 & 5 \\ 6 & 7 \end{bmatrix}$ $B=\begin{bmatrix} 12 & 13 \\ 14 & 15 \end{bmatrix}$	8M	2	L3
	b)	What is a String in Java? Name a few String methods.	4M	2	L1
		OR			
5.		Define inheritance? And explain its type with example programs.	12M	2	L3

UNIT–III

6.	a)	Define package. How to create a user defined package? Explain with example.	8M	3	L2
	b)	Explain method overriding with suitable example.	4M	3	L2
		OR			
7.		What is an exception and explain its handling concepts with an example program	12M	3	L3

UNIT–IV

8.	a)	Explain the Life cycle of a Thread.	6M	4	L1
	b)	Explain the two different ways to create thread with suitable code segment	6M	4	L2
		OR			
9.		What are Generics? Explain bounded generics, generic interfaces with suitable example program.	12M	4	L1, L2

UNIT–V

10.	a)	Define Lambda expression and functional interface? Explain its functions.	6M	5	L1
	b)	Write a program to demonstrate the use of for-each loop using collection example.	6M	5	L3
		OR			
11.	A)	How can you pass Lambda Expressions as Arguments? Briefly explain.	6M	5	L2
	b)	Write a program to read the given input using LinkedList and sort the List.	6M	5	L3

*** End ***

Hall Ticket Number :										

R-20

Code: 20A533T

II B.Tech. I Semester Regular & Supplementary Examinations February 2023

Computer System Architecture

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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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)

		CO	BL
1.	Answer all the following short answer questions (5 X 2 = 10M)		
a)	What is gray code?	CO1	L2
b)	Simplify the Boolean function with minimum literals F= (X+Y)(X+Y^{l})	CO2	L2
c)	Define instruction formats?	CO3	L2
d)	What is a multiprocessor?	CO4	L2
e)	How interrupts are enables and disabled?	CO5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2. a)	Convert the hexadecimal number F3A7C2 to binary and octal with procedures	6M	CO1	L3
b)	What is Karnaugh's map? What are the limitations of Karnaugh map-based digital logic circuit simplification? How do you mitigate the same?	6M	CO1	L2
	OR			
3. a)	Discuss r's complement and r-1's complement with an example.	6M	CO1	L2
b)	Convert the decimal number 8620 into (a) BCD (b)excess-3 code (c) 2421 code (d) binary number	6M	CO1	L3
	UNIT–II			
4. a)	What is an adder? Draw and explain the full adder using 8 to 1 multiplexer.	6M	CO2	L2
b)	Simplify the Boolean function $F(w,x,y,z)= \sum(0,1,2,4,5,6,8,9,12,13,14)$	6M	CO2	L2
	OR			

5.	a)	What is a decoder? Construct 3 to 8-line decoder	6M	CO2	L2
	b)	Explain JK and T flip-flops with neat diagrams	6M	CO2	L2

UNIT–III

6.	a)	Discuss various addressing modes with examples	6M	CO3	L2
	b)	Write the hardware implementation for Booth's multiplication algorithm.	6M	CO3	L2

OR

7.		Explain with a neat flow chart for the addition and subtraction of floating points with examples	12M	CO3	L2

UNIT–IV

8.	a)	Which term refers to the same instruction applied to multiple data streams? Explain with diagram	6M	CO4	L2
	b)	What is a bus organization? Illustrate multiple bus organization with a neat diagram.	6M	CO4	L3

OR

9.	a)	What is memory hierarchy? Draw and explain the concept of the memory hierarchy.	6M	CO4	L3
	b)	Discuss various mapping procedures of cache memory with an example.	6M	CO4	L2

UNIT–V

10.	a)	What are interrupts? Why do we need them? How interrupts are commonly handled? Assuming that currently an instruction is in it's decode cycle and an interrupt has arrived. Are we going to stop the current instruction there itself? If not, why?	6M	CO5	L2
	b)	Difference between a software interrupt and a subroutine call? Give a few examples of external interrupts and internal interrupts.	6M	CO5	L4

OR

11.	a)	What is DMA? Discuss DMA Controller.	6M	CO5	L2
	b)	Explain Standard I/O Interface.	6M	CO5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A531T

II B.Tech. I Semester Regular & Supplementary Examinations February 2023

Database Management Systems

(Common to CSE, AI&DS and AI&ML)

Max. Marks: 70 Time: 3 Hours

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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 X 2 = 10M) CO BL

a) Define database management system and mention its applications. CO1 L2

b) What is an Attribute? Explain different types of Attributes CO2 L2

c) What is a Join? Discuss about various joins used in SQL CO3 L3

d) How is Functional Dependency used? CO4 L4

e) Define Schedule? What is a serial schedule? CO5 L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

Marks CO BL

UNIT–I

2. a) Define Data Abstraction and discuss levels of Abstraction? 6M CO1 L2

b) Describe the architecture of DBMS? 6M CO1 L2

OR

3. a) Write about views and updates on views? 6M CO1 L2

b) Explain different types of database users and write the functions of DBA? 6M CO1 L2

UNIT–II

4. a) Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set? 6M CO2 L3

b) Discuss the correspondence between the ER model construct and the relational model constructs. Show how each ER model construct can be mapped to the relational model. Discuss the option for mapping EER model construct. A 6M CO2 L3

OR

5. a) What is an integrity constraint? Explain its enforcement by DBMS with illustrative example. 6M CO2 L3

	b)	Discuss in detail the operators SELECT, PROJECT and UNION with suitable examples.	6M	CO2	L2

UNIT–III

6.	a)	Illustrate different types of joins in SQL	6M	CO3	L3
	b)	Explain Order by, Group by and Having Clauses with example.	6M	CO3	L3

OR

7.	a)	Consider the following schema: Suppliers (sid, sname, address) Parts (pid, pname, color) Catalog (sid, pid, cost) Write the relational algebraic queries for the following: i) Find the sids of suppliers who supply some red or green part ii) Find the sids of suppliers who supply every red or green part iii) Find the pids of parts supplied by at least two different suppliers.	6M	CO3	L3
	b)	List and explain SQL Relational Set Operators.	6M	CO3	L3

UNIT–IV

8.	a)	What are the problems caused by Redundancy? Explain the need of normalization.	6M	CO4	L4
	b)	Explain about Third NF and BCNF with relevant table structure.	6M	CO4	L4

OR

9.	a)	Discuss about schema refinement in database design.	6M	CO4	L2
	b)	What is multi valued dependency? State and explain fourth normal form based on this concept.	6M	CO4	L4

UNIT–V

10.	a)	Discuss about conflict Serializability with an example.	6M	CO5	L3
	b)	What is 2-phase locking (2PL) protocol? Compare 2PL with Strict 2PL protocol.	6M	CO5	L3

OR

11.	a)	What is transaction? Explain the ACID Properties.	6M	CO5	L3
	b)	Write short notes on Performance of Locking	6M	CO5	L3

*** End ***