

Hall Ticket Number :

**R-20**

**Code: 20A533T**

II B.Tech. I Semester Regular Examinations March 2022

**Computer System Architecture**

( Common to CSE and AI&DS )

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  | Blooms Level |
|--|-----|--------------|
| 1. Answer <i>all</i> the following short answer questions (5X2=10M ) |     |              |
| a) Draw the basic functional units of a computer.                    | CO1 | L1           |
| b) Define logic gates.   | CO2 | L1           |
| c) Define Instruction Format.  | CO3 | L1           |
| d) Define Memory Access Time   | CO4 | L1           |
| e) What is an I/O Interface?   | CO5 | L1           |

**PART-B**

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

- |   | Marks | CO  | Blooms Level |
|---|-------|-----|--------------|
| <b>UNIT-I</b>   |       |     |              |
| 2. a) Explain the basic operational concepts in a computer  | 6M    | CO1 | L2           |
| b) Identify the steps involved to calculate r's complement and (r-1)'s complement with an example.                        | 6M    | CO1 | L1           |
| <b>OR</b>   |       |     |              |
| 3. a) Solve the (+21)+(16) and (-23)+(-13) arithmetic operations using 2's complement representation for negative numbers | 6M    | CO1 | L3           |
| b) Convert these binary system numbers to decimal system numbers a) 100101101 b) 11100.1001                               | 6M    | CO1 | L3           |
| <b>UNIT-II</b>  |       |     |              |
| 4. a) Reduce $AB + (AC)' + AB'C$ ( $AB + C$ ).  | 6M    | CO2 | L3           |
| b) Explain the functionality of a Multiplexer.  | 6M    | CO2 | L2           |
| <b>OR</b>   |       |     |              |
| 5. a) Simplify the following expression $Y=(A+ B) (A + C') (B' + C')$ .   | 6M    | CO2 | L3           |
| b) Explain the design of a 4 bit binary counter with parallel load in detail.   | 6M    | CO2 | L2           |
| <b>UNIT-III</b>   |       |     |              |
| 6. a) Explain with an example how to multiply two unsigned binary numbers   | 6M    | CO3 | L2           |

- 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) With examples explain the Data transfer, Logic and 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

**UNIT-V**

10. a) What are interrupts? How are they handled? 6M CO5 L1
- b) What is I/O interface? and explain it with block diagram. 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

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Hall Ticket Number :									
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<b>R-20</b>
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**Code: 20A531T**

II B.Tech. I Semester Regular Examinations March 2022

**Database Management Systems**

(Common to CSE and AI&DS)

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 <b>all</b> the following short answer questions | ( 5 X 2 = 10M ) | CO  | Blooms Level |
| a) Enlist any four features of DBMS.                      |                 | CO1 | L3           |
| b) What is the use of group by clause in SQL?             |                 | CO2 | L3           |
| c) Enlist DDL and DML commands.                           |                 | CO3 | L3           |
| d) What is 4NF?   |                 | CO4 | L2           |
| e) List out the states of a transaction                   |                 | CO5 | L3           |

**PART-B**

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

- |   | Marks | CO  | Blooms Level |
|---|-------|-----|--------------|
| <b>UNIT-I</b>   |       |     |              |
| 2. a) What is Data Abstraction? Explain about different Views of data?                                      | 6M    | CO1 | L2           |
| b) Compare and Contrast file Systems with database systems?   | 6M    | CO1 | L3           |
| <b>OR</b>   |       |     |              |
| 3. a) Define Instance and Schema? List different data models and explain?                                   | 6M    | CO1 | L2           |
| b) List and Explain extra privileges of Database Administrators over Database users?                        | 6M    | CO1 | L2           |
| <b>UNIT-II</b>  |       |     |              |
| 4. a) Distinguish strong entity set with weak entity set? Draw an ER diagram to illustrate weak entity set? | 7M    | CO2 | L3           |
| b) Explain about different types of integrity constraints?  | 5M    | CO2 | L2           |
| <b>OR</b>   |       |     |              |
| 5. a) Explain the steps for relational database design  | 5M    | CO2 | L2           |
| b) Draw ER Diagram for Internet shopping.   | 7M    | CO2 | L5           |
| <b>UNIT-III</b>   |       |     |              |
| 6. a) Write a Syntax for creating a View? Explain Non-Updatable View.                                       | 4M    | CO3 | L3           |

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 "XYZ" company

8M CO3 L5

**OR**

7. 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

b) Differentiate Stored Procedure and Stored Function.

4M CO3 L3

**UNIT-IV**

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  $F = \{ A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H \}$  List all the candidate keys.

7M CO4 L5

b) What is meant by multivalued dependency? Explain with example.

5M CO4 L4

**UNIT-V**

10. a) What is two-phase locking and how does it guarantee serializability?

6M 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

6M CO5 L3

\*\*\* End \*\*\*

Hall Ticket Number :									
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<b>R-20</b>
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**Code: 20AC33T**

II B.Tech. I Semester Regular Examinations March 2022

**Discrete Mathematics**  
(Common to CSE and AI&DS)

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 <b>all</b> the following short answer questions ( 5 X 2 = 10M )        | CO  | Blooms Level |
| 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 | L1           |
| b) Find the coefficient of $x^4 y^7$ in the expansion of $(x-y)^{10}$            | CO2 | L3           |
| c) Define POSET .Give suitable example.  | CO3 | L1           |
| 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 x 12 = 60 Marks )**

Marks	CO	Blooms Level
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<b>UNIT-I</b>
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- |  |    |     |    |
|--|----|-----|----|
| 2. a) Obtain the principle disjunctive normal form of the propositional formula: $(\sim P \vee R) \wedge (Q \vee P)$ . | 5M | CO1 | L3 |
| b) Define statement and explain various connectives with example.  | 5M | CO1 | L2 |

**OR**

- |   |    |     |    |
|---|----|-----|----|
| 3. a) Show that the following statements are logically equivalent without using truth table. $(P \vee R) \wedge (Q \vee R) \Leftrightarrow (P \vee Q) \vee R$ | 5M | CO1 | L3 |
| b) What is CNF? Explain the procedure to obtain CNF of a given formulae? Find the CNF of $((P \vee Q) \wedge \sim Q) \vee P$ .                                | 5M | CO1 | L3 |

<b>UNIT-II</b>
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- |  |    |     |    |
|--|----|-----|----|
| 4. a) Solve the recurrence relation using substitution method.<br>$a_n = a_{n-1} + 1/n(n+1)$ where $a_0=1$ . | 5M | CO2 | L3 |
| b) Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = n(n-1)$ for $n \geq 2$ by generating functions | 5M | CO2 | L3 |

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 5. a) Solve the recurrence relation using substitution method.<br>$a_n = a_{n-1} + 3n^2 + 3n + 1$ where $a_0=1$ .                            | 5M | CO2 | L3 |
| b) Solve the recurrence relation $a_n - 6a_{n-1} + 9a_{n-2} = 0$ for $n \geq 2$ , given that $a_0=0, a_1=12$ by generating functions method. | 5M | CO2 | L3 |

<b>UNIT-III</b>
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6. a) Establish the following relation in Boolean algebra:

$$(a + b)(b + c) + b \cdot (a + c) = a \cdot b + a \cdot c + b$$

5M CO3 L2

- b) Describe semi groups and monoids.

5M CO3 L4

**OR**

7. a) Define compatibility relation. Find the maximum compatibility block in the given relation.

$X = \{\text{ball, bed, dog, let, egg}\}$  and the relation is given as

$R = \{(x, y) / x, y \in X \wedge x R y \text{ if } x \text{ and } y \text{ contains some common letter.}\}$

5M CO3 L3

- b) Given the relation matrix  $M_R$  of a relation  $R$ ,

$$M_R = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{bmatrix}$$

Find the matrices of  $R^2 = R \circ R$ ,  $R^3 = R \circ R \circ R$ .

5M CO3 L3

<b>UNIT-IV</b>
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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

**OR**

9. a) Prove that the sum of degrees formed by a planar representation of a connected graph  $G$  with  $e$  edges equals  $2e$ .

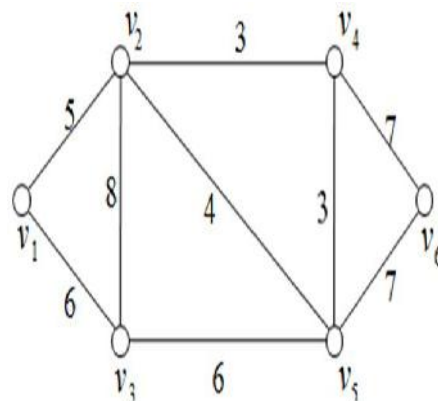
5M CO4 L4

- b) What is Isomorphism? Give a suitable example to show the steps in detail that the two graphs are Isomorphic in nature.

5M CO4 L2

<b>UNIT-V</b>
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10. a) Explain kruskal's algorithm and using the same obtain the minimal spanning tree for the following weighted graph.



7M CO5 L3

- b) What is meant by Pendant Vertices? Explain.

3M CO5 L2

**OR**

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.

5M CO5 L4

\*\*\* End \*\*\*

Hall Ticket Number :										
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<b>R-20</b>
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**Code: 20AC35T**

II B.Tech. I Semester Regular Examinations March 2022

**Management Science**  
( Common to CSE and AI&DS )

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 <b>all</b> the following short answer questions	( 5 X 2 = 10M )	CO	Blooms Level
a) Why is management considered as a science?		CO1	L2
b) What is employee job evaluation?		CO2	L2
c) Just-in-Time Inventory		CO3	L2
d) Profit vs Wealth maximization.		CO4	L2
e) Bases of Market Segmentation		CO5	L2

**PART-B**

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

	Marks	CO	Blooms Level
<b>UNIT-I</b>			
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
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**UNIT-II**

4. Discuss in detail the various functions of Human Resource Management in an IT firm.	12M	CO2	L4
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**OR**

5. Briefly discuss various training methods used in organizations, especially in a manufacturing concern.	12M	CO2	L4
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**UNIT-III**

6. Write a detailed note on the various factors affecting plant location.	12M	CO3	L3
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**OR**

7. a) What is network analysis? 6M CO3 L2  
b) Relate the importance of Project evaluation and review technique. 6M CO3 L3

**UNIT-IV**

8. Explain how financial management is important in performing organizational tasks. 12M CO4 L3

**OR**

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

**UNIT-V**

10. Why is marketing important and describe the various roles and functions of marketing channels? 12M CO5 L3

**OR**

11. Illustrate the various stages in product life cycle? 12M CO5 L3

\*\*\* End \*\*\*



Hall Ticket Number :

**R-20**

**Code: 20A532T**

II B.Tech. I Semester Regular Examinations March 2022

**Object Oriented Programming using Java**

( Common to CSE and AI&DS )

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 | Blooms Level |
|--|----|--------------|
| a) What gets printed when the following program is compiled and run.   |    |              |
| <pre>class test {<br/>    public static void main(String args[]) {<br/>        int i, j, k, l=0;<br/>        k = l++;<br/>        j = ++k;<br/>        i = j++;<br/>        System.out.println(i);<br/>    }<br/>}</pre> |    |              |
|  | 1  | L3           |
| b) Explain method overriding.  | 2  | L2           |
| c) Define interface.   | 3  | L1           |
| d) What is the purpose of multithreaded programming?   | 4  | L2           |
| e) List the importance of List interface.  | 5  | L1           |

**PART-B**

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

	Marks	CO	Blooms Level
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**UNIT-I**

- |   |    |   |    |
|---|----|---|----|
| 2. a) Explain method overloading with an example.                   | 6M | 1 | L2 |
| b) Write a Java program to display Fibonacci series between 1 to n. | 6M | 1 | L1 |

**OR**

- |  |    |   |    |
|--|----|---|----|
| 3. a) Explain the constructor with an example.   | 6M | 1 | L2 |
| b) List the different operators in java. Explain | 6M | 1 | L1 |

**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. 6M 5 L2

\*\*\* End \*\*\*