

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations June 2026

Subject Name: **Advanced Data Structures & Algorithms Analysis**

Time: 3 Hours

Branch: CSE

Max. Marks: 70

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Define the term algorithm and state the criteria the algorithm should satisfy	2M	CO1	L1
	b	Mention the rotations used in AVL trees.	2M	CO1	L2
	c	Distinguish between Breadth First Search and Depth First Search.	2M	CO2	L1
	d	What are the conditions of a binary heap?	2M	CO2	L2
	e	Define feasible solution and optimal solution.	2M	CO3	L1
	f	State Travelling Salesmen Problem?	2M	CO3	L1
	g	What is the branch and bound technique?	2M	CO4	L2
	h	Define N-Queens problem.	2M	CO5	L1
	i	Define P and NP-problems.	2M	CO5	L1
	j	What is the Clique Decision Problem (CDP)?	2M	CO6	L2
PART-B					
UNIT-I					
2	a	Explain the deletion operation in AVL trees with suitable examples and rotations.	10M	CO1	L3
OR					
3	a	Describe the structure and properties of a B-Tree.	5M	CO1	L4
	b	Insert 5,3,12,9,13,22,7,10,11,14,8,6 into a B-tree of order 4.	5M	CO1	L3
UNIT-II					
4	a	Write a program to implement a priority queue using a min-heap	5M	CO2	L4
	b	Explain the basic search algorithms for graphs, including DFS and BFS.	5M	CO2	L2
OR					
5		Sort the following elements in ascending order by using Quicksort taking 17 as pivot element? And show elements after each pass? 24, 47, 15, 8, 9, 4, 40, 30, 12, 17.	10M	CO2	L3
UNIT-III					
6	a	Describe the Bellman-Ford algorithm for Single Source Shortest Paths with negative weights. Illustrate with an example.	5M	CO3	L3
	b	Solve the following job sequencing with deadlines. $n = 4, (P_1, P_2, P_3, P_4) = (100, 10, 15, 27)$ and $(d_1, d_2, d_3, d_4) = (2, 1, 2, 1)$	5M	CO3	L5
OR					
7		Explain the algorithm for Job Sequencing with Deadlines and illustrate it with an example.	10M	CO3	L3
UNIT-IV					
8		Solve the 0/1 Knapsack Problem us backtrack and explain the steps with an example.	10M	CO4	L3
OR					
9		Discuss the steps involved in the branch and bound solution of the assignment problem.	10M	CO4	L3
UNIT-V					
10	a	What are deterministic algorithms? Give examples for them and write the functions of deterministic algorithms.	10M	CO6	L2
OR					
11	a	Explain NP-hard and NP-complete in detail.	10M	CO5	L2

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations June 2026Subject Name: **Database Management Systems****Time: 3 Hours**

Branch: CSE

Max. Marks: 70**Instructions:**

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A

1	a	Describe Instance and Schema of database.	2M	CO1	L1
	b	List the responsibilities of DBA.	2M	CO1	L1
	c	Discuss the basic form of SQL query.	2M	CO2	L1
	d	What is SQL, and why is it essential for working with relational databases?	2M	CO2	L1
	e	What is the purpose of the GROUP BY clause in SQL?	2M	CO3	L1
	f	Define Domain.	2M	CO3	L1
	g	Define First Normal Form?	2M	CO4	L1
	h	What is the difference between 3NF and BCNF?	2M	CO4	L1
	i	What is Reloadable Log Record?	2M	CO5	L1
	j	What is a B+ Tree, and how does it support efficient data retrieval in databases?	2M	CO5	L1

PART-B**UNIT-I**

2	a	Write about different types of schemas and data independence.	5M	CO1	L4
	b	Compare and contrast centralized and client-server architectures.	5M	CO1	L3

OR

3	a	Compare DBMS and File System.	10M	CO1	L3
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UNIT-II

4	a	Demonstrate different DML operations in SQL.	5M	CO2	L2
	b	Describe the union operation in relational algebra. When can it be used?	5M	CO2	L3

OR

5	a	Explain Relational Algebra Operations with examples.	10M	CO2	L4
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UNIT-III

6		Explain Different Types of Joins in SQL with examples.	10M	CO3	L3
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OR

7	a	How natural JOIN operation is different when compared to JOIN operation? Explain with an example.	5M	CO3	L3
	b	What is Relational Model? Explain about various domain and integrity constraints in Relational Model with examples.	5M	CO3	L4

UNIT-IV

8		Compute the closure of the following set F of functional dependencies for relation Schema R = (A, B, C, D, E). $A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$, $E \rightarrow A$. List the candidate keys for R.	10M	CO4	L2
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OR

9	a	Explain Functional Dependencies and types.	10M	CO4	L4
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UNIT-V

10	a	Describe Dependency Preserving Decomposition?	5M	CO5	L4
	b	Explain 2-phase locking protocol.	5M	CO5	L2

OR

11	a	What is Recoverability? Discuss types of recoverable schedules?	5M	CO5	L2
	b	What are the desirable properties of a transaction? Discuss.	5M	CO5	L3

CODE: A10402**R23****H.T.No:****RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN: KURNOOL**

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations June 2026

Subject Name: **Digital Logic and Computer Organization****Time: 3 Hours**

Branch: CSE.

Max Marks: 70**Instructions:**

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Explain universal gates with an example.	2M	CO1	L2
	b	List components of signed binary numbers.	2M	CO1	L2
	c	Write the block diagram of a typical computer and list functional units.	2M	CO1	L2
	d	Classify flip-flops.	2M	CO1	L2
	e	Show the issues associated with floating point numbers.	2M	CO1	L2
	f	Specify the sequence of operation involved when an instruction is executed.	2M	CO1	L2
	g	What are the characteristics of ROM components?	2M	CO1	L2
	h	Classify the different types of semiconductor memories?	2M	CO1	L2
	i	What are interrupts?	2M	CO1	L2
	j	Contrast between parallel and serial communication interfaces?	2M	CO1	L2
PART-B					
UNIT-I					
2		Minimize the $F(A,B,C,D) = \sum (4,5,6,7,12,13,14) + d(1,9,11,15)$ using K-map.	10M	CO1	L6
OR					
3	a	Show the applications for K-map simplification.	5M	CO1	L6
	b	Design 3 to 8 line decoder with neat circuit diagram.	5M	CO1	L6
UNIT-II					
4	a	Explain the operation of a multiplexer and a demultiplexer.	5M	CO2	L2
	b	What are sequential circuits? Explain.	5M	CO2	L3
OR					
5	a	Write a detailed note on different computer generations	5M	CO1	L2
	b	Draw and explain Von Neumann Architecture.	5M	CO2	L2
UNIT-III					
6		Discuss in detail about Instruction execution phase in the Multi programmed context.	10M	CO3	L3
OR					
7		Write algorithm for Floating Point Addition and Subtraction.	10M	CO3	L3
UNIT-IV					
8		Explain the performance metrics of Semiconductor memories. Discuss about advantages of Virtual memory.	10M	CO4	L2
OR					
9	a	Explain the role of the memory manager in a computer system.	5M	CO4	L2
	b	Distinguish between RAM and ROM in detail.	5M	CO4	L2
UNIT-V					
10	a	What are buses? Explain interface circuits.	5M	CO5	L2
	b	What are the significance of learning I/O organizations? Explain.	5M	CO5	L2
OR					
11		Describe in detail about the interrupt driven transfer scheme using a neat block diagram, Distinguish interrupt driven data transfer scheme with DMA.	10M	CO5	L2

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations June 2026

Subject Name: **Discrete Mathematics & Graph Theory**

Branch: CSE

Time: 3 Hours

Max. Marks: 70

Instructions:

1. Answer all 10 questions from Part-A. Each question carries two marks
2. Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Write the truth table for the connective $p \wedge q$.	2M	CO1	L1
	b	Define tautology and contradiction with examples	2M	CO1	L2
	c	Define equivalence relation.	2M	CO2	L1
	d	Let $f(x)=2x+3$ and $g(x)=x^2$. Find $(f \circ g)$.	2M	CO2	L1
	e	State Binomial theorem	2M	CO3	L2
	f	How many numbers can be formed using the digits 1, 3, 4, 5, 6, 8 and 9 if no repetitions are allowed?	2M	CO3	L3
	g	Find the generating function for the sequence $0^2, 1^2, 2^2, 3^2, \dots$	2M	CO4	L3
	h	Determine the sequence generated by $7e^{8x} - 4e^{3x}$	2M	CO4	L2
	i	Define Hamiltonian graphs.	2M	CO5	L3
	j	Draw K_5 . Check whether it contains Hamiltonian cycles.	2M	CO5	L1
PART-B					
UNIT-I					
2	a	What is principle disjunctive normal form? Obtain the PDNF of $P \rightarrow ((P \rightarrow Q) \wedge \neg(\neg Q \vee \neg P))$ and also Obtain PCNF of $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$	10M	CO1	L3
OR					
3	a	Define NAND, NOR & XOR and give their truth tables.	5M	CO1	L3
	b	In how many ways can the 26 letters of the English alphabets be permuted so that none of the patterns CAR, DOG, PUN, BYTE occur?	5M	CO1	L2
UNIT-II					
4	a	Let $X = \{1, 2, 5, 10, 20, 40, 60, 120\}$ and the relation R defined by aRb if and only if a divides b. Check it is Lattice or not?	5M	CO2	L3
	b	State the formula for three sets using inclusion-exclusion	5M	CO2	L2
OR					
5	a	Find the Identity and Inverse elements of the group with the operator * defined as (i) $(a, b) * (c, d) = \{ad-bc, ac+bd\}$ (ii) $a*b = (ab)/3$	5M	CO2	L2
	b	Let $X = \{1, 2, 3, 4\}$ and $R = \{(1,1), (1,4), (2,2), (2,3), (3,2), (3,3), (4,1), (4,4)\}$. Then prove that R is an equivalence relation.	5M	CO2	L2
UNIT-III					
6	a	In how many ways can we distribute 10 identical marbles among 6 distinct containers?	5M	CO3	L3
	b	Find the number of ways of selecting 4 boys and 3 girls from a group of 8 boys and 5 girls.	5M	CO3	L5
OR					
7	a	Find the co-efficient of xyz^2 in the expansion of $(2x-y-z)^4$	10M	CO3	L5
UNIT-IV					

8	a	Find the sequence generated by the following function $3x^3 + e^{2x}$	10M	CO4	L3
OR					
9	a	Solve $a_n - 5a_{n-1} + 6a_{n-2} = 2n, n > 2$ with condition the initial $a_0 = 1, a_1 = 1$. Using generating function.	10M	CO4	L3
UNIT-V					
10	a	Find the Minimal Spanning Tree of the following graph using : i. Prim's Algorithm ii. Kruskal's Algorithm.	10M	CO5	L3 & L6
OR					
11	a	What are the 2 ways of representing a graph? Explain with the following graph:	10M	CO6	L2 & L3

RAVINDRA COLLEGE OF ENGINEERING FOR WOMEN
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations June 2026

Subject Name: Universal Human Values

Time: 3 Hours

Branch: CSE & ECE

Max. Marks: 70

Instructions:

- Answer all 10 questions from Part-A. Each question carries two marks
- Answer one full question from each unit in Part-B. Each full question carries 10 marks

PART-A					
1	a	Why is happiness considered more important than prosperity?	2M	CO1	L1
	b	Explain the role of relationships in holistic development.	2M	CO1	L1
	c	What are the primary differences between the needs of the self and the body?	2M	CO2	L2
	d	Define "Sensation" and explain its role in forming desires.	2M	CO2	L2
	e	How does trust contribute to harmony within a family?	2M	CO3	L3
	f	Explain the concept of right evaluation in respect.	2M	CO3	L3
	g	What are the key activities of material units (jada units)?	2M	CO4	L1
	h	Define conscious (chaitanya) units.	2M	CO4	L2
	i	Define Utility Value (Upayogita Mulya).	2M	CO5	L2
	j	Give an example of ethical conduct in everyday life.	2M	CO6	L4
PART-B					
UNIT-I					
2	a	What is human consciousness, and why is it important to understand it?	5M	CO1	L2
	b	How does human consciousness influence thoughts, actions, and behaviors?	5M	CO1	L2
OR					
3	a	What is meant by natural acceptance, and how can it improve human relationships?	5M	CO1	L2
	b	Define Svatva, Swatantrata, and Swarajya. Explain their significance in the context of personal and societal values.	5M	CO1	L2
UNIT-II					
4	a	How does "Right Understanding" lead to definite human conduct and harmony?	5M	CO2	L3
	b	Why is it important to balance the needs of the body and the self for overall health and happiness?	5M	CO2	L4
OR					
5	a	How does the body recognize and fulfill its needs?	5M	CO2	L3
	b	How do the physical needs of the body differ from the emotional and mental needs of the self?	5M	CO2	L3
UNIT-III					
6	a	Discuss the importance of gratitude in strengthening family bonds.	5M	CO3	L2
	b	Why is self-respect important, and how does it impact one's relationships with others?	5M	CO3	L1
OR					
7	a	Explain how societal differentiation based on wealth impacts mutual respect.	5M	CO3	L4
	b	Discuss the importance of communication in maintaining harmony within families and communities.	5M	CO3	L6
UNIT-IV					
8	a	Discuss the relationship between material units and conscious units, highlighting their roles in human existence and the natural world.	10M	CO4	L4
OR					
9	a	Describe the mutual fulfillment among the four orders of nature. How do the needs of one order contribute to the well-being of another?	5M	CO4	L3

	b	How does the recognition of co-existence in nature lead to more ethical and responsible human behavior?	5M	CO4	L5
UNIT-V					
10	a	Discuss the significance of self-exploration in realizing human values.	5M	CO5	L2
	b	How does ethical conduct affect personal integrity and social trust?	5M	CO5	L4
OR					
11	a	Elaborate on the comprehensive human goal and its relevance to professional ethics. How can professionals align their activities with this goal?	10M	CO6	L2
