Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester - IV

Course Name: Software Engineering **Course Code: BC235T**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1.: Very Short / Short Answer Type **(10×2=20)**

QN	Questions	CO	PO
a.	What is the first phase in most SDLC models?	CO1	PO1
b.	What is verification and validation?	CO2	PO2
c.	What is the primary goal of the Testing phase in the SDLC?	CO3	PO1
d.	What activities are typically included in the Implementation phase?	CO3	PO1
e.	What is unit and integration testing?	CO3	PO2
f.	Explain the following terms: i. Test case ii. Test plan	CO4	PO4
g.	In which SDLC phase is the software actually built?	CO1	PO1
h.	Define the term maintenance in SDLC.	CO5	PO4
i.	How does the selection of an inappropriate SDLC model affect a project?	CO2	PO2
j.	Explain the term Risk in brief with an example.	CO5	PO1

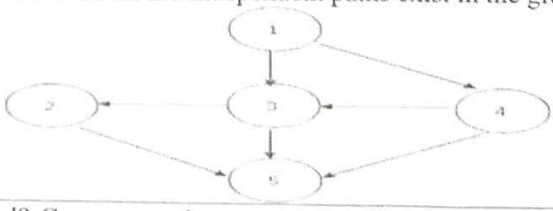
Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) **(5×4=20)**

a.	Describe how you would classify a software project aimed at creating a new operating system into SDLC phases.	CO1	PO2
b.	What is SRS? What are the attributes of good SRS?	CO2	PO2
c.	Discuss the significance of thorough testing in the software development lifecycle.	CO3	PO1
d.	Describe the relationship between the Analysis and Design phases of the SDLC.	CO3	PO2
e.	Explain the different types of testing and their purpose within the SDLC.	CO3	PO1
f.	What are the challenges typically faced during the Maintenance phase of a software project?	CO3	PO2
g.	Explain how the application of your knowledge of SDLC phases and activities can lead to better software project outcomes.	CO5	PO8

Q.3. Structured Question (Attempt any three out of four) **(3×10=30)**

a.	Explain any one of from the following: a) V-Model b) Spiral Model	CO1, CO2	PO2
b.	Discuss the various processes involved in the Design phase, including architectural design and detailed design.	CO3	PO1; PO4
c.	Justify the need of testing. Explain any one technique related to black box testing.	CO4	PO1
d.	Describe the different types of maintenance activities and the processes involved in managing software changes after deployment.	CO3, CO5	PO1, PO8

Q.4. Long Answer / Essay type (Attempt any two out of three) **(2×15=30)**

a.	Compare and contrast the Prototyping and Waterfall models. Discuss their strengths and weaknesses.	CO1	PO2
b.	What is program graph? What is cyclomatic complexity? Consider the given graph to calculate cyclomatic complexity.Also write all the independent paths exist in the graph. 	CO4	PO1, PO2
c.	What is CoCOMo model? Compare and contrast the basic, intermediate and detailed CoCOMo Models.	CO5	PO8

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Enrol. No. S R H U 17/06/25 Regn. No. D D

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester – IV

Course Name: Database Management Systems **Course Code: BCA207**

Time allotted: 03 Hours

Note: Read all the instructions carefully. **Max. Marks: 100**

Q.1. Attempt all. **(10×2=20)**

QN	Questions	CO	PO
a.	What are the components used in E-R diagram design?	CO2	PO1
b.	Define the word Durability.	CO5	PO1
c.	List aggregate functions supported by SQL.	CO3	PO1
d.	Why we need constraints?	CO2	PO1,2
e.	What are anomalies?	CO4	PO1
f.	What is serializability?	CO5	PO1
g.	What is mean by referential integrity?	CO2	PO1,2
h.	Define composite attribute.	CO2	PO1
i.	Which normal form is based on full functional dependency?	CO4	PO1
j.	What do you mean by secondary key?	CO2	PO1

Q.2. Attempt any five out of Seven. **(5×4=20)**

QN	Questions	CO	PO
a.	Explain the concept of Aggregation and Generalization in context of ER model.	CO2	PO1,2,8
b.	Why Primary key constraints are important? Explain with an example.	CO2	PO1,2
c.	Explain various type of data model. Compare and contrast.	CO1	PO1,2
d.	What is Database? Explain three levels of architecture of database system.	CO1	PO1
e.	In how many categories failure of Transactions can be divided? Write in brief about them.	CO5	PO1,2
f.	Define Join dependency with the help of example.	CO3	PO1
g.	Explain log-Based Recovery in detail.	CO5	PO1

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Q.3. Attempt any three out of four. **(3×10=30)**

QN	Questions	CO	PO
a.	Attempt all. (5+5) (i) Consider the below transaction. is the transaction being conflict serializable? Justify you answer. S: R2(X), W3(X) C, W1(X) C, W2(Y), R2(Z) C, R4(X), R4(Y) C	CO5	PO1,2
	(ii) R = (A, B, C, G, H, I) and the set of functional dependencies A →B, A →C, CG→ H,CG→ I, B → H List the candidate keys for R	CO4	PO1,2
b.	Attempt all. (5+5) (i) List and discuss the Armstrong rule for functional dependencies.	CO3	PO1,8
	(ii) Explain GROUP BY and ORDER BY command with example.	CO3	PO1,4
c.	Attempt all. (5+5) (i) Define the concept of Transaction. With the help of a diagram, describe State Transition Diagram for a Database Transaction.	CO5	PO1
	(ii) Explain various type of relational algebra operation from set theory with example.	CO2	PO1,2
d.	Attempt all. (3+3+4) (i) Database Anomalies	CO4	PO1
	(ii) Multivalued Dependency	CO4	PO1
	(iii) Join	CO3	PO1

Q.4. Attempt any two out of three. **(2×15=30)**

QN	Questions	CO	PO
a.	(i) Design an E-R diagram for college management system consisting of student, department, faculty, course and hostel. Clearly highlight the entities, relationships, primary key and the mapping constraints.	CO3	PO1,2,8
	(ii) What do you mean by DBMS? Give advantages of DBMS over file processing system.	CO1	PO1,2
b.	(i) Explain view Serializability with an example? How it is different from conflict Serializability?	CO5	PO1,2
	(ii) What is the two-phase locking protocol? How does it guarantee serializability?	CO5	PO1
c.	(i) What is lossless decomposition? Explain how it is achieved by taking a suitable example.	CO2	PO3
	(ii) Explain the following commands insert, create, drop, update by writing their syntax.	CO4	PO1,2,4

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Enrol. No. | S | R | H | U | | | | | | | | | Regn. No. | D | D | | | | | | | | | |

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester - IV

Course Name: Optimization Techniques **Course Code: BC245T**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Objectives Type

(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all.(10×2=20)

QN	Questions	CO	PO
a.	Define slack variables.	1	1
b.	The total number of allocations in solution of transportation problem with 4-rows and 4-columns is_	2	3
c.	What is the condition for entering artificial variable in LPP?	1	8
d.	For a maximization problem the objective function coefficient for an artificial variable is…	1	2
e.	The saddle point of the following table is…….. 17 4 5 8 7 9 -5 6 2	3	2
f.	This innovative science of Operation Research was discovered during……..	2	2
g.	The saddle point of the following table is…….. 4 6 7 12 9 10 6 7 8	3	2
h.	Operations research use models to help the management to determine its……	4	1
i.	What is the standard form of LPP?	1	1
j.	In two-phase method, an……variable is never considered for re-entry into the basis.	1	8

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) (5×4=20)

QN	Questions	CO	PO
a.	Solve the following LPP by graphical method Max. $Z = 5x_1 + 3x_2$ s.t. $3x_1 + 5x_2 \leq 15$ $5x_1 + 2x_2 \leq 10$ $x_1, x_2 \geq 0$	1	2
b.	Find the initial basic feasible solution of given transportation problem by North West corner method I II III IV V Supply A 1 2 6 2 3 800 B 3 4 5 8 1 600 C 3 1 1 2 6 200 D 4 7 3 5 4 400 Demand 400 100 700 300 500	2	2

c.	Solve the following LPP by simplex method Max.Z $=2x_1 - 4x_2 + 2x_3$ s.t. $2x_1 + x_2 \leq 10$ $x_1 + 2x_2 - 2x_3 \leq 20$ $x_2 + 2x_3 \leq 5$ $x_1, x_2, x_3 \geq 0$	1	2
d.	Solve the following LPP by M-method Max.Z $= x_1 + x_2$ .s.t. $x_1 + x_2 \geq 4$ $2x_1 + x_2 \geq 6$ $x_1, x_2 \geq 0$	1	2
e.	Explain simplex method for a linear programming problems.	1	1
f.	Find the optimal strategy for each of the player and the value of the game 9 8 5 6	3	1
g.	Write the dual of given LPP Min Z= $3x_1 + x_2$ s.t. $x_1 + x_2 \geq 1$ $2x_1 + 3x_2 \geq 2$ $x_1, x_2 \geq 0$	1	1

Q.3. Structured Question (Attempt any three out of four) (3×10=30)

QN	Questions	CO	PO
a.	Write the dual of given LPP Min Z= $4x_1 - 8x_2$ s.t. $2x_1 + 6x_2 \geq 3$ $x_1 + 4x_2 \geq 6$ $6x_1 + x_2 \geq 5$ $x_1 + 6x_2 \geq 8$ $x_1, x_2 \geq 0$	1	1
b.	Solve the following LPP by 2-Phase method Min.Z $= 6x_1 + 3x_2$ s.t. $x_1 + x_2 \geq 1$ $2x_1 - x_2 \geq 1$ $x_2 \leq 2$ $x_1, x_2 \geq 0$	1	2

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c. Solve game problem by dominance property

18	4	6	4
6	2	13	7
11	5	17	3
7	6	12	2

CO: 3 PO: 1

d. Solve the following LPP by dual simplex method

Min Z= $3x_1+x_2$
s.t. $x_1 + x_2 \geq 1$
$2x_1 + 3x_2 \geq 2$
$x_1, x_2 \geq 0$

CO: 1 PO: 1

Q.4. Long Answer / Essay type (Attempt any two out of three) **(2×15=30)**

QN	Questions	CO	PO
a.	Determine the optimal sequence job that minimize the total time required in performing the following jobs on three machine in the order A,B and C	2	1

Job	A	B	C
1	10	6	8
2	8	4	7
3	12	6	5
4	6	5	9
5	9	3	10
6	11	4	6
7	9	2	5

b. A project has the following activities and other characteristics — CO: 3 PO: 1

Activity	Preceding Activity	Expected Time
A	-	16
B	-	20
C	A	8
D	A	10
E	B,C	6
F	D,E	12

(i) Draw the network diagram for the project.
(ii)Identify the critical path.
(iii)Prepare the activity schedule for the project.
(iv) Determine the mean project completion time.

c. The production department of a company requires 3600 kg of raw material for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs 36 and the holding cost is Rs 2.5 per kg per year . — CO: 4 PO: 2

Help the purchase manager to determine the
(i)Annual ordering cost.
(ii)The optimal lot size.
(iii)The minimum yearly total inventory cost.

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Enrol. No. | S | R | H | U | | | | | | | | | Regn. No. | D | D | | | | | | | | | |

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester - IV

Course Name: Computer Based Numerical and Statistical Techniques **Course Code: BCA206**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Attempt all. **(10×2=20)**

QN	Questions	CO	PO
a.	Define Simpson's $^3/_8$ rd rule.	3	1
b.	State Newton's Rapson method.	1	1
c.	Define Runge-Kutta methods.	4	1
d.	Define Newton's backward interpolation method.	2	1
e.	Define Secant method.	2	1
f.	Define Picard method.	4	1
g.	Define Lagrange's interpolation formula.	2	1
h.	State Euler's method.	4	1
i.	State Regula Falsi method.	1	1
j.	Define Trapezodial rule.	3	1

Q.2. Attempt any five out of Seven. **(5×4=20)**

QN	Questions	CO	PO
a.	Evaluate $I = \int_0^1 \frac{1}{1+x^2} dx$ by using Simpson's $^1/_3$ rule	3	2
b.	Find $y(0.2)$ given $\frac{dy}{dx} = x + y, y(0) = 1$ by using Taylor method.	4	1
c.	Evaluate $\int_0^{10} \left(\frac{1}{1+x}\right) dx$ by Trapezoidal rule.	3	2
d.	Solve $\frac{dy}{dx} = y - x^2, y(0) = 1$, by Picard method upto third approximation. Hence find the value of $y(0.1)$.	4	1
e.	Given $\frac{dy}{dx} = -y$ and $y(0) = 1$, determine the value of y at $x = 0.02$ by Taylor method.	4	2
f.	Evaluate $\sqrt{(159)}$ by using Lagrange's interpolation formula	2	8

x	154	156	158	160
$y=\sqrt{(x)}$	12.410	12.490	12.569	12.649

g.	Evaluate $I = \int_{-3}^{3} x^4 dx$ by using Simpson's $^3/_8$ rule.	3	2

P.T.O/-

Q.3. Attempt any three out of four. **(3×10=30)**

QN	Questions	CO	
a.	From the following table find $f(2)$ by using Newton's interpolation formula x: 4, 5, 7, 10, 11, 13 $f(x)$: 48, 100, 294, 900, 1210, 2028	2	
b.	Find the positive root of $2x^3 - 3x - 6 = 0$ by Newton's Raphson method.	1	2
c.	Solve for a positive root of $x^3 - 5x + 7 = 0$ by Regula Falsi method.	1	2
d.	Fit a straight line to the data given below. Also estimate the value of at $x = 2.5$ x: 0, 1, 2, 3, 4 y: 1, 1.8, 3.3, 4.5, 6.3	5	1

Q.4. Attempt any two out of three. **(2×15=30)**

QN	Questions	CO	PO
a.	Apply the fourth order Runge-Kutta method to find $y(0.2)$ given that $\frac{dy}{dx} = -y, y(0) = 1$. by taking $h = 0.1$.	4	2
b.	Solve $x^3 + 2x^2 + 10 = 20$ by iteration method.	1	2
c.	Find the positive root of $x^3 - 3x - 1 = 0$ bisection method.	1	2

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Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester – IV

Course Name: Design and Analysis of Algorithm **Course Code: BCA208**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Attempt all Sections & Questions.

Q.1. Objectives Type

(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all. **(10×2=20)**

a.	Define the term "Algorithm".	CO1	PO1,PO8
b.	Explain the importance of analyzing the time complexity of an algorithm.	CO1	PO1,PO8
c.	Define the term "Asymptotic Analysis".	CO1	PO1,PO8
d.	Discuss the basic steps in the complete development of an algorithm.	CO1	PO1,PO8
e.	Explain Greedy programming in brief.	CO2	PO1,PO8
f.	What do you mean by minimum spanning tree?	CO2	PO1,PO8
g.	What is dynamic programming?	CO3	PO1,PO8
h.	What do you mean by hamiltonion cycle?	CO4	PO1,PO8
i.	Define BST.	CO5	PO1,PO8
j.	What do you mean by multistage graph?	CO5	PO1,PO8

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) **(5×4=20)**

a.	Discuss the concept of "Graph Traversal" algorithms. Compare and contrast Breadth-First Search (BFS) and Depth-First Search (DFS).	CO5	PO1,PO8
b.	Explain the concept of "Backtracking" in algorithm design. Provide an example problem that can be solved using backtracking.	CO4	PO1,PO2,PO8
c.	Explain the concept of "Greedy Choice Property" and provide an example of an algorithm that exhibits this property.	CO2	PO1,PO2,PO8
d.	Solve the 0/1 knapsack problem with the following weights and values: weights = [2, 3, 4, 5] values = [3, 4, 5, 6] knapsack capacity = 8	CO3	PO1,PO2
e.	Given an array of integers [5, 3, 8, 2, 9, 1], perform a bubble sort and write down the steps and the sorted array.	CO1	PO1,PO2
f.	Write Bellman ford Algorithm.	CO2	PO1,PO2,PO8
g.	Explain Kruskal's Minimum cost spanning tree algorithm with suitable example.	CO2	PO1,PO2,PO8

P.T.O./-

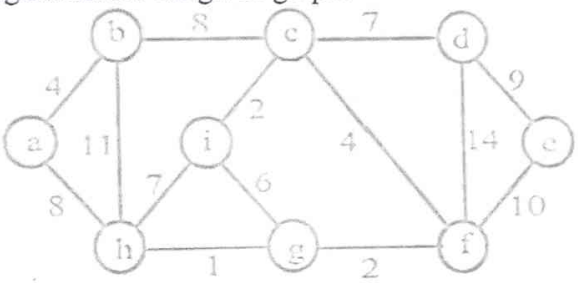
Q.3. Structured Question (Attempt any three out of four) (3×10=30)

a.	Write and explain the Kruskal algorithm to find the Minimum Spanning Tree of a graph with suitable example.	CO2	PO1,PO2
b.	Write Merge sort algorithm and sort the following sequence {23, 11, 5, 15, 68, 31, 4, 17} using merge sort.	CO1	PO1,PO2,PO3
c.	Write down the Bellman Ford algorithm to solve the single source shortest path problem also write its time complexity.	CO2	PO1,PO2,PO3
d.	What is travelling salesman problem (TSP)? Find the solution of following TSP using Branch & Bound method.	CO4	PO1,PO2,PO3

0	20	30	10	11
15	0	16	4	2
3	5	0	2	4
19	6	18	0	3
16	4	7	16	0

Q.4. Long Answer / Essay type (Attempt any two out of three) (2×15=30)

a.	Explain the method of finding Hamiltonian cycles in a graph using backtracking method with suitable example.	CO4	PO1,PO2,PO8
b.	Apply the greedy technique to find the minimum spanning tree using Prim's algorithm for the given graph.	CO2	PO1,PO2
c.	Find the optimal solution to the fractional knapsack instant n=7, m=15 using greedy method.	CO3	PO1,PO2



Object	1	2	3	4	5	6	7
Weight	02	03	05	07	01	04	01
Profit	10	05	15	07	06	18	03

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Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester - IV

Course Name: Web Technology

Course Code: BC242T

Time allotted: 03 Hours

Note: Read all the instructions carefully.

Max. Marks: 100

Q.1. Attempt all. **(10×2=20)**

QN	Questions	CO	PO
a.	Explain HTML document format.	2	1
b.	<a href="url "> tag is used for…..	3	2
c.	POP stands for Post Office Protocol. **True/False**	2	1
d.	ISP stands for……..	2	1
e.	WSDL stands for…	3	2
f.	DTD stands for Document Transfer Definition. **True/False**	2	1
g.	List out types of stylesheets.	3	2
h.	is used for…	2	1
i.	URL stands for Universal Resource Locator. **True/False**	2	1
j.	Define Ruby on Rails.	4	2

Q.2. Attempt any five out of Seven. **(5×4=20)**

QN	Questions	CO	PO
a.	Explain stylesheet and its types with example.	2	2
b.	Explain Open APIs, RSS Feed and JSON with suitable example.	3	1
c.	What is AJAX? Why it is important? Explain with the help of an example.	3	1
d.	What are the differences between Get and post methods in form submitting? Give the case where we can use get and we can use post methods.	3	2
e.	Explain search engine and its types. What is web crawling?	5	2
f.	Explain list and its types in HTML.	2	1
g.	Explain MVC architecture and how the MVC architecture is used by the Ruby on Rails with suitable example.	4	1

P.T.O./-

Q.3. Attempt any three out of four. **(3×10=30)**

QN	Questions	CO	PO
a.	Explain Java Script. Explain how objects, properties, methods are defined in JavaScript. Write a JavaScript code to print the smallest number among three using function.	3	1
b.	Explain any 4 HTML tags with suitable example. Differentiate HTML and DHTML. Write HTML code to design the following form. On clicking Submit button the user will be directed to "login.php" page. Registeration Form Kindly fill in this form to register Username Password Re-enter password Email Submit Reset	2	2
c.	Explain the basic structure of HTML page. Explain the following with suitable example: HTTP, SMTP, POP3, MIME, IMAP, DNS, Web Server, Web Browser.	1	1
d.	Explain CSS. Explain all types of stylesheets using suitable example. Explain XML and DTD. Write XML and DTD code for the following: Table: Student Rollno, Name, Class, Marks (Physics, Chemistry, Maths) 1001, Amit, BCA, 50, 60, 70	3	1

Q.4. Attempt any two out of three. **(2×15=30)**

QN	Questions	CO	PO
a.	Explain web 2.0. Explain the key features of web 2.0. How it defers from web 1.0, and 3.0. Explain the following terms & technologies of web 2.0: (i) Blogs (ii) Wiki (iii) Podcasting (iv) Social networks (v) Widgets	5	1
b.	Define web service. Explain SOAP, UDDI and WSDL with suitable example. Explain Express and Node JS with suitable example.	3	2
c.	Define AJAX. Explain how AJAX works using block diagram. Explain XMLHttpRequest object, its properties, and the methods using suitable example.	4	1

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Enrol. No. S R H U

Regn. No. D D

END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester - IV

Course Name: Operating System **Course Code: BC244T**

Time allotted: 03 Hours

Note: Read all the instructions carefully. **Max. Marks: 100**

Q.1. Objective Type

(Very short/ short Answer, MCQ, One-liners, Fill in the blanks, True/ False) Attempt all. (10×2=20)

QN	Questions	CO	PO
a.	Define Operating System.	1	1
b.	Distinguish between System Call and System Interrupt.	2	2
c.	Define multiprogramming operating system.	1	1
d.	Explain thrashing.	3	2
e.	Discuss swapping with a suitable diagram.	3	1
f.	Write the difference between LRU and optimal page replacement algorithms.	3	2
g.	Distinguish between C-SCAN and SCAN disk scheduling algorithms.	4	2
h.	Define demand paging.	3	1
i.	Explain the procedure to map logical address and physical address.	2	2
j.	Define page fault.	2	1

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) (5×4=20)

QN	Questions	CO	PO
a.	Define process. Also, explain various stages of process life-cycle.	2	1
b.	Distinguish between internal fragmentation and external fragmentation with examples.	3	1
c.	Briefly explain the producer and consumer problem with respect to cooperating processes.	2	2
d.	Discuss the various ways to recovery from deadlock.	2	2
e.	Explain different functions performed by an operating system.	1	2
f.	Define semaphore and its types.	2	3
g.	Explain fragmentation. Also, explain the different techniques to remove fragmentation in case of MFT and MVT system.	4	2

Q.3. Structured Question (Attempt any three out of four) (3×10=30)

QN	Questions	CO	PO
a.	Write the essential conditions of occurrence of deadlock. Also, explain each one of them with a method to handle the deadlock.	2	2
b.	Define virtual memory. Find hit ratio (total page faults) for the following sequence of page requests, using OPT (optimal) method of page replacement: 1, 2, 4, 2, 1, 3, 2, 5, 6, 7, 2, 4, 2, 3, 5, 6 and there are three free frames available.	3	2
c.	Consider the situation in which the disk read/write head is currently located at track 45 (of tracks 0 – 255) and moving in the positive direction. Assume that the following track requests have been made in this order: 40, 67, 11, 240, 87. Write the order in which optimized C-SCAN would service these requests and find the total seek distance.	4	2
d.	Discuss Banker's & safely algorithms.	5	2

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Q.4. Long Answer / Essay type (Attempt any two out of three) **(2×15=30)**

QN	Questions	CO	PO
a.	(i) Explain real-time operating system. Also, differentiate between soft real-time operating system and hard real-time operating systems. (ii) Find the ATAT (average turnaround time) and average waiting time (AWT) using the priority scheduling in pre-emptive mode using Gantt chart: (Lowest number, highest priority).	2	2
b.	(i) Describe the following algorithms First-fit, Worst-fit and Best-fit with the help of examples. (ii) Given memory partitions of 200KB, 600KB, 300KB, 400KB, and 700KB. How would each of the First-fit and Best-fit algorithms place processes of 312KB, 517KB, 212KB and 526KB?	3	2
c.	Consider the following system:	2	2

Process No.	P_1	P_2	P_3	P_4	P_5	P_6
Priority	4	5	7	2	1	6
Arrival Time	0	1	2	3	4	5
Burst Time	4	5	1	2	3	6

Max. Need			
	R_1	R_2	R_3
P_1	3	6	8
P_2	4	3	3
P_3	3	4	4

Allocated Resources			
	R_1	R_2	R_3
P_1	2	2	3
P_2	2	0	3
P_3	1	2	4

Total Allocated		
R_1	R_2	R_3
5	4	10

Total Exist		
R_1	R_2	R_3
7	7	10

a. Is the current allocation state safe?

b. Would the following requests be granted in the current state?

i) Process P1 requests (1, 1, 0)
ii) Process P2 requests (0, 1, 0)
iii) Process P3 requests (0, 1, 0)

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END SEMESTER EXAMINATION, JUNE- 2025

BCA Semester - IV

Course Name: Python Programming **Course Code: BC243T**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Attempt all. **(10×2=20)**

QN	Questions	CO	PO
a.	What keyword exits a function and returns a value?	1	1
b.	What keyword starts a class definition?	2	2
c.	What type is True in Python?	1	1
d.	What type of value is "123"?	2	2
e.	What keyword is used for exception handling?	2	2
f.	What is the default return value of a function without return?	1	1
g.	What module provides mathematical functions?	2	2
h.	What concept allows a class to inherit from another?	1	1
i.	What operator is used for exponentiation?	2	2
j.	What symbol is used for slicing?	2	2

Q.2. Attempt any five out of Seven. **(5×4=20)**

a.	Write a Python program that prints "Hello, Python!" and includes both **single-line** and **multi-line comments**.	1	2
b.	Write a Python program that accepts a user's name and age as input and prints a message: "Hello <name>, you are <age> years old!"	2	2
c.	List and explain any **four key features** of Python.	2	1
d.	Using the concept of control structure determine the prime numbers in given range using Python.	3	2
e.	Explain the looping statements (while and for loops) with an example.	2	1
f.	Explain the basic Tuple operations with examples. Illustrate a program to check whether an element 'y' and 'a' belongs to the tuple mytuple = ('p','y','t','h','o',n') and after printing the result, delete the Tuple.	3	2
g.	Write a program that takes a number as input and prints its square root, factorial, and logarithm using functions from the math module.	2	2

Q.3. Attempt any three out of four. **(3×10=30)**

a.	Explain how dictionary is different from a **list**? Write a Python program that creates a dictionary with three key-value pairs and performs the following operations: ➢ Retrieve a value using a key ➢ Add a new key-value pair ➢ Delete a key-value pair	2	3
b.	Describe the methods and operations of Dictionaries.	3	2
c.	Explain the terminology of raising an exception concept with sample program.	4	3
d.	Write short notes on following data types (Also mention whether they are mutable or immutable) • String • List • Tuple • Dictionary • Set	4	2

Q.4. Attempt any two out of three. **(2×15=30)**

a.	Write a program that takes input for a student's marks and prints the grade based on the following criteria: (Chained Conditional (if-elif-else)) 1. 90 and above: A 2. 80 - 89: B 3. 70 - 79: C 4. 60 - 69: D 5. Below 60: F	5	3
b.	Compare and contrast different functions and methods used in dictionaries and list	5	2
c.	Differentiate between single, multiple, multilevel, hierarchical, and hybrid inheritance in Python with examples for each.	3	3

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