

END SEMESTER EXAMINATION, JUNE- 2024**BCA Semester - IV**

04/6/24

**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 $\frac{3}{8}$ 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 Trapezoidal rule.	3	1

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

Q.2. Attempt any five out of Seven.

QN	Questions	CO	PO										
a.	Evaluate $I = \int_0^6 \frac{1}{1+x} dx$ by using Simpson's $\frac{1}{3}$ rule	3	2										
b.	Find $y(0.1)$ given $\frac{dy}{dx} = x - y^2, y(0) = 1$ by using Taylor method.	4	1										
c.	Evaluate $\int_0^1 \left(\frac{1}{1+x}\right) dx$ by using Trapezoidal rule.	3	2										
d.	Solve $\frac{dy}{dx} = y - x, y(0) = 1$, by Picard method upto third approximation. Hence find the value of $y(0.2)$.	4	1										
e.	Given $\frac{dy}{dx} = 1 - y$ and $y(0) = 0$, determine the value of y at $x = 0.1$ by Taylor method.	4	2										
f.	Evaluate $\sqrt{(153)}$ by using Lagrange's interpolation formula <table><tr><td>x</td><td>150</td><td>152</td><td>154</td><td>156</td></tr><tr><td>$y=\sqrt{(x)}$</td><td>12.247</td><td>12.239</td><td>12.410</td><td>12.490</td></tr></table>	x	150	152	154	156	$y=\sqrt{(x)}$	12.247	12.239	12.410	12.490	2	8
x	150	152	154	156									
$y=\sqrt{(x)}$	12.247	12.239	12.410	12.490									
g.	Evaluate $I = \int_0^1 \frac{1}{1+x^2} dx$ by using Simpson's $\frac{3}{8}$ rule	3	2										

P.T.O/-

Q.3. Attempt any three out of four.

(3×10=30) Enrol. No.

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

QN	Questions	CO															
a.	From the following table find $f(15)$ by using Newton's interpolation formula <table border="1" style="margin: 10px auto;"> <tr> <td>x</td> <td>4</td> <td>5</td> <td>7</td> <td>10</td> <td>11</td> <td>13</td> </tr> <tr> <td>$f(x)$</td> <td>48</td> <td>100</td> <td>294</td> <td>900</td> <td>1210</td> <td>2028</td> </tr> </table>	x	4	5	7	10	11	13	$f(x)$	48	100	294	900	1210	2028	2	
x	4	5	7	10	11	13											
$f(x)$	48	100	294	900	1210	2028											
b.	Find the positive root of $3x - \cos x - 1 = 0$ by Newton's Raphson method.	1	2														
c.	Solve for a positive root of $x - \cos x = 0$ by Regula Falsi method.	1	2														
d.	Fit a straight line to the data given below. Also estimate the value of y at $x = 2.5$ <table border="1" style="margin: 10px auto;"> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>y</td> <td>1</td> <td>1.8</td> <td>3.3</td> <td>4.5</td> <td>6.3</td> </tr> </table>	x	0	1	2	3	4	y	1	1.8	3.3	4.5	6.3	5	1		
x	0	1	2	3	4												
y	1	1.8	3.3	4.5	6.3												

Q.4. Attempt any two out of three.

(2×15=30)

QN	Questions	CO	
a.	Apply the fourth order Runge-Kutta method to find $y(0.3)$ given that $\frac{dy}{dx} = -xy^2 - y, y(0) = 1$ by taking $h = 0.1$.	4	2
b.	Solve $x^3 + x^2 = 100$ by iteration method.	1	2
c.	Find the positive root of $x^3 - x^2 - 1 = 0$ bisection method.	1	2

Enrol. No.

S	R	H	U																
---	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Regn. No.

D	D																		
---	---	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

END SEMESTER EXAMINATION, JUNE- 2024
BCA Semester - IV

Course Name: Database Management Systems**Course Code: BCA207****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 is the output of following statement? $\sigma_{\text{subject} = \text{"Hindi"}}(\text{Books})$	CO2	PO1
b.	Differentiate between Truncate and drop command.	CO3	PO1 ,2
c.	What are non-prime attributes? Explain with the help of example	CO3	PO1
d.	List any four applications of DBMS.	CO1	PO1
e.	Explain alter command in SQL with example.	CO3	PO3
f.	Differentiate instance and schema.	CO1	PO1
g.	Explain count function in SQL?	CO3	PO1
h.	Define SQL.	CO3	PO1
i.	Define Functional Dependency.	CO4	PO1
j.	Discuss the term aborted state.	CO5	PO1

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

QN	Questions	CO	PO
a.	What is a Concurrency control? Explain with an example.	CO5	PO1
b.	Draw E-R diagram for college management system. List keys and relationships.	CO2	PO1 ,2,4, 8
c.	What is join? Explain inner and outer join with example.	CO3	PO1
d.	Define Transactions in DBMS with suitable example.	CO5	PO1
e.	What do you mean by serializable? Explain with example.	CO5	PO1 ,2
f.	What is Primary Key? Explain some desirable Primary Key characteristics.	CO2	PO1
g.	Explain Database anomalies with example.	CO4	PO1 ,2

P.T.O./-

Q.3. Attempt any three out of four.

(3×10=30)

QN	Questions	CO	PO
a.	Consider the relational table given below and assess about the following SQL queries. Employee (Emp_no, Name, Department, Salary). (10) (i) list all the employees whose name starts with the letter 'L'. (ii) Find the maximum salary given to employees in department. (iii) Find the number of employees working in 'accounts' department. (iv) Find the department wise salary from the table. (v) Find the employee who is getting the minimum salary.	CO4	PO1, 4
b.	Write Short notes on- (i) Data Models (ii) Database Language (5+5)	CO1 CO1	PO1 PO1, 4
c.	Attempt all. (i) Let R = (A, B, C, D, E, F) be a relation scheme with the following dependencies. $C \rightarrow F, E \rightarrow A, EC \rightarrow D, A \rightarrow B$ Find the candidate key and normal form. (ii) Check whether the given schedule S is conflict serializable or not- $S : R1(A), R2(A), R1(B), R2(B), R3(B), W1(A), W2(B)$ (5+5)	CO4 CO5	PO1, 2 PO1, 2
d.	Attempt all. (i) What do you mean by DDL Command? Explain how to create table with syntax in SQL (ii) List the purpose of Database Management System. (5+5)	CO3 CO1	PO1, 2, 4 PO1

Q.4. Attempt any two out of three.

(2×15=30)

QN	Questions	CO	PO
a.	(i) Explain how relations in E-R diagram can be converted from E-R diagram to tables. (ii) Explain Conflict Serializability with an example? How it is different from View Serializability?	CO2 CO5	PO1, 2 PO1, 2
b.	(i) Explain the following commands insert, create, and update by writing their syntax. (ii) Define the term atomicity, consistency, isolation and durability with help of example.	CO3 CO5	PO1, 2, 4, 8 PO1
c.	(i) List and discuss the six-inference rule for functional dependencies. Give relevant example. (ii) Write difference between database management systems and file management system.	CO4 CO1	PO1 PO1, 2

Enrol. No.

S	R	H	U											
---	---	---	---	--	--	--	--	--	--	--	--	--	--	--

Regn. No.

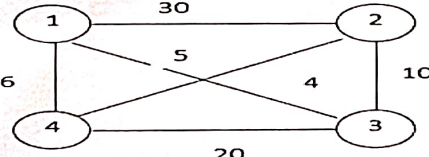
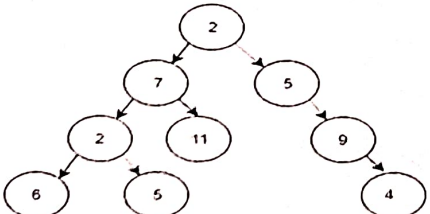
D	D													
---	---	--	--	--	--	--	--	--	--	--	--	--	--	--

END SEMESTER EXAMINATION, JUNE- 2024
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.****Q.1. Objectives Type****(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all. (10×2=20)**

a.	Illustrate the applications of Graph Coloring Problem.	CO4	PO1,PO8
b.	Define principle of optimality.	CO2	PO1,PO8
c.	Discuss Branch and Bound Techniques.	CO4	PO1,PO8
d.	Discuss backtracking problem solving approach.	CO4	PO1,PO8
e.	Discuss the basic steps in the complete development of an algorithm.	CO1	PO1,PO8
f.	Explain and compare best and worst time complexity of Quick Sort.	CO1	PO1,PO8
g.	What is B-Tree?	CO5	PO1,PO8
h.	What is Graph?	CO5	PO1,PO8
i.	Define divide and conquer technique.	CO1	PO1,PO8
j.	What do mean by greedy techniques?	CO2	PO1,PO8

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

a.	Solve the following travelling sales person problem represented as a graph shown in Fig below using dynamic programming. 	CO4	PO1,PO2
b.	Compare Divide and Conquer and Dynamic programming methodologies.	CO1	PO1,PO2
c.	Explain Asymptotic notations in algorithm analysis	CO1	PO1,PO2,PO3
d.	Write the applications of BFS and DFS	CO5	PO1,PO2,PO3
e.	For the tree below, write the pre-order and post-order traversal. 	CO5	PO1,PO2
f.	Explain Kruskal's Minimum cost spanning tree algorithm with suitable example.	CO2	PO1,PO2,PO3
g.	What is the difference between depth-first search (DFS) and breadth-first search (BFS) algorithms? Provide examples of problems where each algorithm is commonly applied.	CO5	PO1,PO2

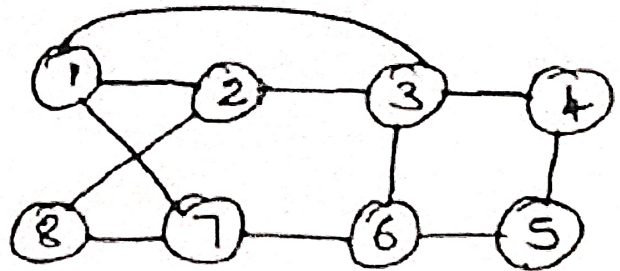
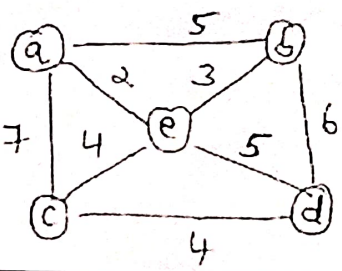
P.T.O./-

Q.3. Structured Question (Attempt any three out of four)

a. What is Knapsack problem? Solve Fractional knapsack problem using greedy programming for the following four items with their weights $w = \{3, 5, 9, 5\}$ and values $P = \{45, 30, 45, 10\}$ with knapsack capacity is 16.	CO3	(3×10=) PO1,PO2
b. Illustrate n queen's problem. Examine 4 queen's problem using back tracking method.	CO4	PO1,PO2,PO8
c. What do you understand by heap sorting? Sort the following sequence $\{25, 57, 48, 36, 12, 91, 86, 32\}$ using heap sort.	CO5	PO1,PO2,PO8
d. What are single source shortest paths? Write down Dijkstra's algorithm for it.	CO2	PO1,PO2,PO8

Q.4. Long Answer / Essay type (Attempt any two out of three)

(2×15=30)

a. Prove that if the weights on the edge of the connected undirected graph are distinct then there is a unique Minimum Spanning Tree. Give an example in this regard. Also discuss Kruskal's Minimum Spanning Tree in detail.	CO2	PO1,PO2,PO8
b. Define Hamiltonian cycle. Check whether the Hamiltonian cycle exists for the graph given below. 	CO4	PO1,PO2,PO8
c. Apply prim's algorithm and kruskal's algorithm method to find the minimum cost spanning tree to graph shown below. 	CO2	PO1,PO2

Enrol. No.

S	R	H	U											
---	---	---	---	--	--	--	--	--	--	--	--	--	--	--

Regn. No.

D	D													
---	---	--	--	--	--	--	--	--	--	--	--	--	--	--

END SEMESTER EXAMINATION, JUNE- 2024**BCA Semester - IV****Course Name: Programming in JAVA****Course Code: BCA209****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)**

S.No	Questions	CO	PO
a.	Define System.out.println.	1	1
b.	What is recursion?	1	1
c.	What is the difference between static variable and instance variable?	1	1
d.	What is a package?	2	2
e.	Why JAVA array index starts with 0?	2	1
f.	What is meant by garbage collection?	3	2
g.	Why Java is Platform Independent?	3	2
h.	What is meant by Nested Class?	2	1
i.	What are the uses of the keyword 'final'?	2	1
j.	Why main () method is static in JAVA?	3	2

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

S.No	Questions	CO	PO
a.	Explain following bitwise operator with an example: left shift operator right shift operator	1	1
b.	Why java became platform independent language? Explain.	1	1
c.	Write a program to check whether given number is prime or not.	1	1
d.	Illustrate with example the use of switch case statement	1	1
e.	Calculate length of string.	3	1
f.	What is inheritance?	2	3
g.	Define method overloading?	3	1

P.T.O./-

Q.3. Structured Question (Attempt any three out of four)

(3×10=30)

S.No	Questions	CO	PO
a.	(i) Write a Java program that takes a number from the user and generates an integer between 1 and 7. It displays the weekday name (ii) What is event Handling? (iii) Why we need thread synchronization?	1	1
b.	(i) Write a Java program to make such a pattern like a pyramid with a number that repeats in the same row. (ii) What is thread? Draw thread life cycle diagram in Java. (iii) What is exception? WAP to accept a password from the user and throw "Authentication Failure" exception if the password is incorrect.	5	2
c.	(i) Write a Java program to compute the body mass index (BMI). (ii) Write a program to check whether given number is prime or not. (iii) Discuss try, catch, finally, throw and throws with example.	2	2
d.	(i) What is the relevance of FOR loop? (ii) How is new operator different from the new instance operator in JAVA? (iii) How does exception affect the program if we don't handle them?	3	3

Q.4. Long Answer / Essay type (Attempt any two out of three)

(2×15=30)

S.No	Questions	CO	PO
a.	(i) Discuss constructors in detail with examples? (ii) WAP to implement user defined exception.	1	1
b.	(i) How you will define methods or functions in JAVA? (ii) Explain Object oriented concept with examples.	3	1
c.	(i) Write a Program in JAVA in order to define or express decision making and data types. (ii) Write a Program of classes and object using SCANNER, consider the class STUDENT and select the properties by your own.	4	2

END SEMESTER EXAMINATION, JUNE- 2024**BCA Semester - IV****Course Name: Programming in JAVA****Course Code: BCA209****Max. Marks: 100****Time allotted: 03 Hours****Note: Read all the instructions carefully.****Section (A)****(10x 2 = 20)****Q.1. Attempt all questions.**

- a. What is the importance of package in java?
- b. What is the use of appletviewer tool?
- c. Define the term **Menu** in java.
- d. Differentiate single inheritance and multilevel inheritance?
- e. Why do we use public keyword in java?
- f. Why do we use private keyword in java?
- g. Why do we use protected keyword in java?
- h. Why do we use streams in java?
- i. Write the full form of API and JSP.
- j. Define the term class.

Section (B)**(5 x 7 = 35)****Q.2. Attempt any 5 questions.**

- a. How do we use strings in java? Differentiate String and StringBuffer.
- b. How do we use **for loop**, **while loop** and **do..while loop** in java? Explain the syntax.
- c. Differentiate user defined packages and predefined packages in java.
- d. How many ways are there to run an applet? Explain.
- e. Explain decision making statements used in java.
- f. Explain JSP exception handling in java.
- g. Write a program in java to find out whether a given number is even or odd.

Section (C)**(3 x 15 = 45)****Attempt any 3 questions.**

- Q.3. a. What is data type? Explain fundamental data types and abstract data types used in java. **8**
b. What is exception handling? Differentiate throw and throws keywords. **7**
- Q.4. a. What is event driven programming? How do we handle an event? Explain with a suitable example. **8**
b. Explain the term layout management? Explain any two layouts used in java with proper syntax. **7**
- Q.5. a. Explain all the looping statements used in java with proper syntax. **8**
b. What is database connectivity? How do we implement it in java? **7**
- Q.6. a. Explain the following:
 - **Java Architecture** **4**
 - **Features of java** **4**
b. Define the following terms:
 - **Servlet** **3.5**
 - **JSP** **3.5**
- Q.7. a. What is the concept of networking in java? Write the methods to create a client socket and server socket. **8**
b. Explain all the operators used in java. **7**

Enrol. No.

S	R	H	U								
---	---	---	---	--	--	--	--	--	--	--	--

Regn. No.

D	D										
---	---	--	--	--	--	--	--	--	--	--	--

END SEMESTER EXAMINATION, JUNE- 2024
BCA Semester – IV

Course Name: E-Commerce**Course Code: BCA210**

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)

S.No	Questions	C O	P O
a.	What is the purpose of a product recommendation engine in e-commerce?	4	4
b.	Define "virtual storefront" in the context of online retail.	3	3
c.	What is meant by "dynamic pricing" in e-commerce?	1	8
d.	Explain the concept of "affiliate marketing" in e-commerce.	5	3
e.	What role does social media play in e-commerce marketing strategies?	2	2
f.	Define "customer lifetime value" (CLV) in e-commerce analytics.	4	2
g.	What is the significance of user experience (UX) design in e-commerce websites?	1	1
h.	Explain the concept of "omnichannel inventory management" in e-commerce.	2	3
i.	What are the benefits of implementing a loyalty program in an e-commerce business?	1	8
j.	Define "fraud detection" in e-commerce security measures.	3	1

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven)

(5×4=20)

S.No	Questions	CO	PO
a.	How does the use of augmented reality (AR) and virtual reality (VR) technologies enhance the e-commerce shopping experience?	5	1
b.	What strategies can e-commerce businesses employ to effectively manage and optimize their supply chain operations?	3	4
c.	Discuss the role of chatbots and virtual assistants in providing customer support and enhancing user engagement in e-commerce.	1	1
d.	How do e-commerce businesses leverage data analytics and customer insights to personalize marketing strategies and improve sales?	5	8
e.	Explain the concept of "voice commerce" and its potential impact on the future of online shopping.	3	4
f.	What are the emerging trends in sustainable e-commerce practices, and how are businesses incorporating eco-friendly initiatives into their operations?	1	1
g.	Discuss the challenges and opportunities of integrating blockchain technology into e-commerce platforms to enhance security and transparency in transactions.	5	1

P.T.O./-

Q.3. Structured Question (Attempt any three out of four)

(3×10=30)

S.No	Questions	CO	PO
a.	What are the key challenges and opportunities for e-commerce businesses in leveraging voice commerce technologies, such as smart speakers and voice assistants, to enhance the shopping experience and drive sales?	3	2
b.	Explore the role of user interface (UI) and user experience (UX) design in e-commerce websites and mobile apps, including best practices for optimizing navigation, layout, and accessibility to improve conversion rates and customer satisfaction.	4	3
c.	Discuss the impact of social commerce on e-commerce trends, including the rise of shoppable posts, influencer marketing, and social media marketplaces, and analyze how businesses can effectively leverage social platforms to drive engagement and sales.	4	2
d.	Evaluate the role of customer reviews and ratings in e-commerce, including their influence on purchasing decisions, brand perception, and search engine visibility, and discuss strategies for managing and leveraging customer feedback to enhance reputation and trust.	5	2

Q.4. Long Answer / Essay type (Attempt any two out of three)

(2×15=30)

S.No	Questions	CO	PO
a.	How do e-commerce businesses address the challenges of international expansion, including localization, cultural adaptation, and compliance with foreign regulations, to successfully enter and grow in new global markets?	3	4
b.	Analyze the role of data analytics and business intelligence in e-commerce, including the use of customer data, sales trends, and market insights to inform strategic decision-making, optimize marketing campaigns, and drive revenue growth.	5	8
c.	Explore the ethical implications of emerging e-commerce technologies, such as biometric authentication, facial recognition, and predictive analytics, in terms of privacy, data security, and consumer consent, and discuss the need for ethical guidelines and regulations to ensure responsible innovation in e-commerce.	4	4
