

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)
B.C.A. Sem-IV : WINTER: 2025
SUBJECT: ADVANCED JAVA

Day : Monday
Date : 17/11/2025

W-26295-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 100

N.B.

- 1) Attempt **ANY FIVE** questions from Section-I and any **TWO** questions from Section-II.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SAME** answer book.

SECTION – I

- Q.1 Explain the life cycle of a thread in Java with the help of a diagram. Discuss the significance of each state in thread execution. (12)
- Q.2 What is the difference between Vector and ArrayList? Explain with example. (12)
- Q.3 Describe the concept of ports in network programming. Explain with example. (12)
- Q.4 What is JDBC, and why is it used? Write a simple program to establish a database connection. (12)
- Q.5 What is a Java Servlet? Explain the life cycle of a servlet with the help of a diagram. (12)
- Q.6 What are JSP implicit objects? List and explain any five implicit objects available in JSP. (12)
- Q.7 Write short notes on **ANY TWO** of the following : (12)
- a) Generics.
 - b) Simple Socket.
 - c) Metadata.

SECTION – II

- Q.8 Write a Java program to create a database table named employees with columns for id, name, designation, and salary. Insert three records into the table and retrieve all the records to display them. (20)
- Q.9 Develop a Java servlet that accepts user input (e.g. name, and email) via an HTML form using the GET method and displays the input back to the user in the response. (20)
- Q.10 Write a Java program to simulate a banking system where multiple threads (representing customers) can deposit and withdraw money from a shared bank account. Use synchronized methods to ensure thread safety. (20)

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)
B.C.A. Sem-IV : WINTER: 2025
SUBJECT: OPTIMIZATION TECHNIQUES

Day : Friday
Date : 21/11/2025

W-26297-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 100

N.B.

- 1) Attempt any **FIVE** questions from Section – I and any **TWO** questions from Section – II.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both sections should be written in **SAME** answer book.
- 4) Use of non-programmable calculator is allowed.

SECTION – I

Q.1 What is Optimization Technique? Discuss various phases in Optimization Technique. (12)

Q.2 Solve the following LPP by Graphical Method. (12)
Maximize $Z = 3x + 4y$
Subject to $x + y \leq 6$
 $2x + y \leq 8$
 $x, y \geq 0$

Q.3 Find the I.B.F.S. of the following transportation problem by
i) NWCM ii) LCM (12)

Factory	Warehouse				Capacity
	W ₁	W ₂	W ₃	W ₄	
F ₁	19	30	50	16	7
F ₂	70	30	40	60	9
F ₃	40	8	70	20	18
Requirement	5	8	7	14	

Q.4 Solve the following assignment problem for minimization. (12)

Salesman	Territory			
	I	II	III	IV
A	42	35	28	21
B	30	25	20	15
C	30	25	20	15
D	24	20	16	12

Q.5 Discuss the characteristics and applications of Optimization Techniques in detail. (12)

P.T.O.

- Q.6 Consider the following profit table along with the given probabilities of each state. (12)

Strategies	States		
	N ₁	N ₂	N ₃
	Probability of States		
	0.4	0.8	0.3
S ₁	30	20	-18
S ₂	35	18	20
S ₃	50	-15	30

- Calculate: i) Expected Monetary Value (EMV)
ii) Expected Value with Perfect Information (EVPI).

- Q.7 Write short notes on any TWO of the following: (12)
- Degeneracy in transportation problem
 - Unbounded solution in LPP
 - Decision trees

SECTION – II

- Q.8 Find the optimum solution for the following T.P. (20)

Plant	Warehouse				Capacity
	A	B	C	D	
X	19	22	19	16	70
Y	17	13	17	17	60
Z	16	15	19	11	90
Demand	70	50	70	30	

- Q.9 For the following project details: (20)

Activity	Duration
(1-2)	3
(1-3)	2
(1-4)	6
(2-4)	8
(2-5)	5
(3-4)	4
(4-5)	6

- Draw a network diagram
 - Find earliest and latest time for each activity
 - Find critical path and total project duration
- Q.10 a) Write steps in Hungarian method for solving Assignment Problems. (10)
- b) Solve the following A.P. for Minimization. (10)

Jobs	Machines			
	W	X	Y	Z
A	18	24	28	32
B	8	13	17	18
C	10	15	19	22

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)

B.C.A. Sem-IV : WINTER: 2025

SUBJECT: ADVANCED HTML WITH JAVA SCRIPT & CSS

Day : Wednesday

Date : 19/11/2025

W-26296-2025

Time : 10:00 AM-01:00 PM

Max. Marks : **100**

N.B.

- 1) Attempt **Any FIVE** questions from **Section – I.** and **Any TWO** questions from **Section – II.**
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Answer to both the sections should be written in the **SAME** answer books.

SECTION – I

- Q.1 What is hyperlink in HTML? Describe the types of hyperlink available. (12)
- Q.2 Describe the use of graphics in HTML5, compare the <canvas> element and SVG. (12)
- Q.3 Explain the different types of CSS selectors, including element, class, ID and attribute selectors. (12)
- Q.4 Discuss the different types of dialog boxes available in JavaScript. (12)
- Q.5 Discuss the difference between global and local variables. Explain how variable scope affects the behavior of functions. (12)
- Q.6 Explain control statements used in JavaScript program and illustrate with example. (12)
- Q.7 Write short answer question on **ANY TWO** of the following: (12)
- a) Session and Cookies
 - b) JavaScript Built-in Objects
 - c) JavaScript functions

SECTION – II

- Q.8 Create a webpage that applies different CSS styles using inline, embedded and external style sheets. Demonstrate how these three approaches affect the maintenance and performance of your webpage, especially when updating styles. (20)
- Q.9 Write a Java Script program that validates a form containing fields for the user's name, email address, and phone number. Use regular expressions to ensure the email and phone number follow the correct format. If validation fails, display appropriate error messages to the user. (20)
- Q.10 Create a simple to-do-list application using JavaScript where users can add, edit, and delete tasks. Implement this using events such as click, dblclick and keypress, and show how these events enhance user interaction with the webpage. (20)

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)

B.C.A. Sem-IV : WINTER: 2025

SUBJECT: COMPUTER NETWORKS

Day : Saturday
Date : 15/11/2025

W-26294-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 100

N.B.:

- 1) Attempt ANY FOUR questions from section - I and attempt ANY TWO questions from section - II.
- 2) Figures to the right indicate FULL marks.
- 3) Answers to both the sections should be written in SAME answer book.

SECTION - I

- Q. 1 a) What are the layers of the OSI protocol stack? Briefly list out their functions. (08)
- b) Compare point to point networks and broadcast networks. (07)
- Q. 2 a) Discuss various Transmission Impairments. (08)
- b) What is multiplexing? Explain frequency division multiplexing in detail. (07)
- Q. 3 What are the different routing algorithms? Describe distance vector routing algorithm and multicast routing algorithm with their merits and demerits. (15)
- Q. 4 a) Define UDP. Give the characteristics of it. Discuss the header format of it. (08)
- b) Explain concept of token ring in detail. (07)
- Q. 5 What is sensor network? What are the applications of sensor network? Explain design issues of a wireless sensor network. (15)
- Q. 6 Write short note on ANY THREE of the following: (15)
- a) Intranet
 - b) Infrared waves
 - c) POP
 - d) IGMP

SECTION - II

- Q. 7 What is MANET? Explain characteristics and applications of it. Also discuss destination-sequenced distance vector protocol. (20)
- Q. 8 a) Give the outline of IPv6 addressing. Why IPv6 is preferred over IPv4? (10)
- b) Find the class of each address with justification. (10)
- i) 11000000.10000010.00011011.11111100
 - ii) 253.15.15.131
 - iii) 128.123.123.123
- Q. 9 As a network designer, you have been assigned task of designing the network of 75 computers for ABC Organization. Which topology will you prefer to design this network? Why? Give the minimum hardware requirements to build this network. (20)