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

Day : Saturday
Date : 24/05/2025

S-26297-2025

Time : 02:00 PM-05:00 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 Explain characteristics and scope of Optimization Techniques in detail. **(12)**

Q.2 Solve the following LPP by Graphical Method. **(12)**

Maximize $Z = 8x + y$

Subject to $x + y \leq 40$

$2x + y \leq 60$

$x \geq, y \geq 0$

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

	Job			
Workers	**1**	**2**	**3**	**Supply**
X	10	3	9	**400**
Y	12	10	5	**300**
Z	8	11	12	**300**
Demand	**200**	**300**	**500**	

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

	Employees				
Jobs	**I**	**II**	**III**	**IV**	**V**
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

Q.5 Discuss the various phases 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)

	States		
	N_1	N_2	N_3
Strategies	Probability of States		
	0.4	0.7	0.2
S_1	25	20	-8
S_2	28	16	14
S_3	30	-15	16

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)

a) Decision trees
b) Network Analysis
c) Degeneracy in transportation problem

SECTION – II

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

	Destinations				
Sources	A	B	C	D	Supply
I	30	11	15	17	150
II	19	17	18	13	200
III	14	15	13	12	125
Demand	80	100	75	145	

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

Activity	Duration
(1–2)	4
(2–3)	16
(2–4)	10
(2–5)	8
(3–5)	9
(4–5)	3
(5–6)	5
(6–7)	6
(6–8)	12
(7–8)	14

i) Draw a network diagram ii) Find earliest and latest time for each activity
iii) Find critical path and total project duration

Q.10 a) Explain the steps involved in Hungarian method for solving Assignment Problems. (10)

b) Solve the following A.P. for Minimization. (10)

	Districts				
Salesmen	A	B	C	D	E
I	32	38	40	28	40
II	40	24	28	21	36
III	41	27	33	30	37
IV	22	38	41	36	36
V	29	33	40	35	39

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)
B.C.A. Sem-IV : SUMMER : 2025
SUBJECT: COMPUTER NETWORKS

Day : Saturday
Date : 17/05/2025

S-26294-2025

Time : 02:00 PM-05:00 PM
Max. Marks : 100

N.B.

1) Attempt **ANY FOUR** 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 a) What is network? Give the goals of network. **(08)**
b) Explain the terms: **(07)**
i) MAN ii) Ethernet

Q.2 Explain the TCP /IP reference model in detail. Also compare it with OSI reference model. **(15)**

Q.3 Differentiate between: **(15)**

a) Static routing and Dynamic routing
b) Time division multiplexing and Frequency division multiplexing
c) 3G and 4G

Q.4 What is routing? Why is it necessary? Explain distance vector routing algorithm with example. **(15)**

Q.5 Explain the concept of MANET with its characteristics, advantages and disadvantages. **(15)**

Q.6 Write short note on **ANY THREE** of the following : **(15)**

a) Circuit switching
b) Frame relay
c) IGMP
d) Extranet

SECTION – II

Q.7 As a network engineer, you have been assigned task of designing network of 130 computers. Give the minimum hardware requirement to build this network. Which topology will you prefer? Why? **(20)**

Q.8 What do you mean by wireless sensor network? Give the applications and challenges to deploy it. **(20)**

Q.9 a) Identify the class of IP addresses given below with justification. **(10)**
i) 117.100.100.100
ii) 226. 254. 234. 254
iii) 195.0.0.1

b) Explain the concept of token bus and token ring in brief. **(10)**

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-IV : SUMMER : 2025
SUBJECT: ENTREPRENEURSHIP DEVELOPMENT

Day : Saturday
Date : 24/05/2025

S-18781-2025

Time : 02:00 PM-05:00 PM
Max. Marks : 60

N.B.:

1) Q. No. 4 is **COMPULSORY.**
2) Attempt any **TWO** questions from Q. No. 1 to Q. No. 3 from Section –I.
3) Attempt any **TWO** questions from Q. No. 5 to Q. No. 7 from Section –II.
4) Figures to the **RIGHT** indicate **FULL** marks.
5) Answers to both the sections should be written in **SAME** answer book.

SECTION – I

Q.1 Elaborate the role of entrepreneurship in the economic growth and innovation. **(10)**

Q.2 List and explain the various schemes initiated by the Government to promote entrepreneurship. **(10)**

Q.3 Explain the meaning of a business plan. Write the contents of a business plan. **(10)**

Q.4 Write short note on **ANY TWO** of the following : **(10)**

a) Venture Capital
b) DIC
c) Elevator Pitch
d) EDP(Entrepreneurship Development program)

SECTION – II

Q.5 What are the sources of finance for entrepreneurs? **(15)**

Q.6 List and describe the various methods that can be used by entrepreneurs to generate new business ideas. **(15)**

Q.7 Explain the term intellectual property rights and state its importance in entrepreneurship development. **(15)**

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-IV : SUMMER : 2025
SUBJECT: JAVA PROGRAMMING

Day : Thursday
Date : 22/05/2025

S-18779-2025

Time : 02:00 PM-05:00 PM
Max. Marks : 60

N.B.

1) **Q. No. 4** from Section –I is **COMPULSORY.**
2) Answer **ANY TWO** questions from Q. No. 1, 2, 3, in Section-I and answer **ANY TWO** questions from Q. No. 5, 6, 7 in Section-II
3) Figures to right indicate full marks.
4) Answers to both the sections should be written in **SAME** answer book.

SECTION-I

Q. 1 Explain the concept of loops in Java. Write a Java program to display the multiplication table of a number entered by the user using a for loop. **(12)**

Q. 2 What is Exception Handling? Explain the try-catch-finally block in Java with an example. **(12)**

Q. 3 Illustrate different types of inheritance supported in Java. Discuss multilevel inheritance in detail with an appropriate example. **(12)**

Q. 4 Write Short Notes on ANY THREE of the following: **(12)**

a) Concept of Wrapper Classes
b) Access modifiers
c) Concepts of Object-Oriented Programming
d) System.in, System.out and System.err

SECTION-II

Q. 5 What is thread synchronization in Java? Why is it important in concurrent programming? How can synchronization be achieved using the synchronized keyword? Provide an example. **(12)**

Q. 6 Describe the lifecycle of an applet in Java. Illustrate with a suitable diagram. **(12)**

Q. 7 Explain the concept of class and object in Java. Write a Java program to create a class student with data members (name, roll number, marks) and member functions (to set and display details). **(12)**

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)

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

SUBJECT: ADVANCED HTML WITH JAVA SCRIPT & CSS

Day : Thursday | Time : 02:00 PM-05:00 PM

Date : 22/05/2025 | **S-26296-2025** | 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 Describe the various table attributes is HTML and illustrate with example. **(12)**

Q.2 Explain the key features of HTML. Discuss how these features improves the development of modern web application. **(12)**

Q.3 Explain different types of style sheets in CSS. How do inline, embedded and extended style sheet differs in terms of usage, maintenance and performance. **(12)**

Q.4 Explain the advantages and limitations of JavaScript in web development. **(12)**

Q.5 State and explain JavaScript's built-in objects with example. **(12)**

Q.6 Discuss the difference between global and local variables, and explain how variable scope affects the behavior of functions. **(12)**

Q.7 Write short answer question on **ANY TWO** of the following: **(12)**

a) Dialog Box

b) Session and Cookies

c) CSS Selector

SECTION – II

Q.8 Create HTML table that uses cellpadding, rowspacing, rowspan and colspan attributes to display students grades for multiple subjects in well-structured format. Include at least two merge cells using rowspan & colspan. **(20)**

Q.9 Design a simple webpage with HTML5 semantic elements like <header>, <nav>, <section>, <article>, and <footer>. Use these elements to structure the blog homepage layout, ensuring it is accessible and well-structured. **(20)**

Q.10 Write a JavaScript program that validates a form containing fields for the user name, email, address and phone number, use regular expression to ensure the email and phone number follows correct format. If validation fails, display appropriate message to user. **(20)**

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-IV : SUMMER : 2025
SUBJECT: OPERATIONS RESEARCH

Day : Friday
Date : 23/05/2025

S-18780-2025

Time : 02:00 PM-05:00 PM
Max. Marks : 60

N. B. :

1) **Q. No. 4** from Section – I is **COMPULSORY.**
2) Attempt **ANY TWO** questions from **Q. No. 1** to **Q. No. 3** from Section – **I.**
3) Attempt **ANY TWO** questions from **Q. No. 5** to **Q. No. 7** from Section – **II.**
4) Figures to the right indicate **FULL** marks.
5) Answers to both the sections should be written in **SAME** answer book.
6) Use of non-programmable calculator is **ALLOWED.**

SECTION – I

Q. 1 Describe the historical background of Operations Research and what are some of its significant uses today? **(12)**

Q. 2 Solve the LPP by graphical method: **(12)**

Maximize $Z = 10x + 30y$

Subject to :

$5x + 2y \leq 200$

$2y \geq 80$

$-10x + 5y \geq 100$

$x, y \geq 0.$

Q. 3 In the newly launched factory, four machines have been installed and there are five experts available to operate them. The cost of assigning each machine to a worker is given in the table below. Determine the optimal assignment schedule. **(12)**

Machines	Workers				
	A	B	C	D	E
M1	11	25	14	20	15
M2	14	--	14	12	10
M3	36	21	14	28	26
M4	16	22	--	18	11

Q. 4 Write short notes on **ANY TWO** of the following: **(12)**

a) Balanced and unbalanced transportation problem

b) Expected Value of Perfect Information (EVPI)

c) Unbounded solutions and Infeasible solutions

P. T. O.

SECTION – II

Q. 5 Find the Initial Basic Feasible Solution of following Transportation problem by using: **(12)**

i) Vogel's Approximation Method.

ii) North-West Corner Rule

And also discuss which method of cost effective and how much cost you saved?

Sources	Destination				Supply
	P	Q	R	S	
O1	1	6	5	10	30
O2	12	8	10	3	55
O3	9	17	8	1	25
Demand	20	30	15	45	

Q. 6 A project consists of the following jobs: **(12)**

Job	1 – 2	1 – 3	1 – 4	2 – 6	3 – 4	3 – 5	4 – 5	5 – 6	4 – 7	6 – 7
Duration (Days)	6	5	10	2	3	4	6	2	9	3

i) Draw network diagram.

ii) Find critical path and total project duration.

iii) Find Earliest Start (ES) and Latest Finish (LF) time with total float for each activity.

Q. 7 Consider the following pay-off (profit) table, apply the Hurwicz Critierion with an optimism coefficient (α) of 0.75 to determine the best investment decision. Find, which alternative should the company choose based on the Hurwicz Critierion **(12)**

Alternative	States of Nature			
	S1	S2	S3	S4
A1	25	12	20	24
A2	18	27	19	20
A3	21	8	21	18
A4	30	31	19	32

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-IV : SUMMER : 2025
SUBJECT: SOFTWARE TESTING

Day : Wednesday
Date : 21/05/2025

S-18778-2025

Time : 02:00 PM-05:00 PM
Max. Marks : 60

N.B.

1. Q.No. 4 from Section - I is **COMPULSORY.**
2. Solve **ANY TWO** from **Q.No 1 to Q.No 3** in **Section-I**
3. Solve **ANY TWO** from **Q.No 5 to Q.No 7** in **Section-II**
4. Figures to the **RIGHT** indicate **FULL** marks.
5. Answers to both the sections should be written in **SAME** answer book.

SECTION – I

Q.1 **a)** Explain various phases of Software Testing process. **(06)**

b) What is the role of 'Unit Testing' in software testing. **(06)**

Q.2 **a)** Explain Debugging process with suitable diagram. **(06)**

b) Define 'Verification'. Explain various techniques of verification. **(06)**

Q.3 **a)** Explain importance and approaches of Integration Testing. **(12)**

Q.4 Write short notes on **ANY TWO** of the following **(12)**

a) Equivalence Testing
b) System Testing
c) Testing for Real Time System
d) Testing of Client-Server Architecture.

SECTION – II

Q.5 What is the purpose of White Box Testing? Explain Basis Path Testing in detail. **(12)**

Q.6 What are different types of Risks? Explain role of testing in Risk Management. **(12)**

Q.7 What is Validation Testing? Explain Alpha & Beta Testing in detail. **(12)**

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

Day : Tuesday
Date : 20/05/2025

S-26295-2025

Time : 02:00 PM-05:00 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 how servlets handle client-server communication. How do request and response objects facilitate this communication? **(12)**

Q.2 What is the difference between Vector and ArrayList? Explain with examples. **(12)**

Q.3 What is the purpose of the ServerSocket class in Java? Explain with example. **(12)**

Q.4 What is JSP? Explain advantages of JSP over servlets. **(12)**

Q.5 What is the difference between Runnable and Thread in Java? Illustrate with an example of how to create and run a thread using both approaches. **(12)**

Q.6 What is a JDBC driver? List the different types of JDBC drivers and explain its role in database connection. **(12)**

Q.7 Write short notes on **ANY TWO** of the following : **(12)**

a) Generics.
b) Stream.
c) Metadata.

SECTION – II

Q.8 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.9 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)**

Q.10 Write a Java program to connect to a database and execute a parameterized query using PreparedStatement. For example, retrieve the details of employees whose salary is greater than a specified amount. **(20)**

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BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-IV : SUMMER : 2025
SUBJECT: COMPUTER NETWORKS

Day : Tuesday
Date : 20/05/2025

S-18777-2025

Time : 02:00 PM-05:00 PM
Max. Marks : 60

N. B.:

1) **Q. No. 4 is COMPULSORY.**
2) Attempt **ANY TWO** questions from **Q. No. 1 to Q. No. 3** from Section – **I.**
3) Attempt **ANY TWO** questions from **Q. No. 5 to Q. No. 7** from Section – **II.**
4) Figures to the **RIGHT** indicate **FULL** marks.
5) Answers to both the sections should be written in **SAME** answer book.

SECTION – I

Q. 1 a) What is topology? Discuss the various topologies with their merits and demerits. **(06)**

b) What is routing? Explain flooding routing algorithm in detail. **(06)**

Q. 2 a) What is congestion? Discuss various congestion control techniques in brief. **(06)**

b) Differentiate between TCP and UDP. **(06)**

Q. 3 What is Bluetooth? Discuss topologies associated with Bluetooth. Also explain Bluetooth architecture in brief. **(12)**

Q. 4 Write short notes on **ANY THREE** of the following: **(12)**

a) Circuit switching
b) IGMP
c) Real time transport protocol
d) Multicast address
e) Domain Name

SECTION – II

Q. 5 What is the purpose of TCP/IP Model? How is it differ from OSI Model? Explain in detail. **(12)**

Q. 6 Explain Shortest Path routing algorithm and Link State routing algorithm with their merits and demerits. **(12)**

Q. 7 As a network Engineer, you have been assigned task to design network of 150 computers. Give the minimum hardware requirement to build this network. Which topology will you prefer? Why? **(12)**

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