



End-Semester Assessment – Apr/May- 2025

Program : MCA

Semester: II

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: Object Oriented Programming Using Java

Course Code: PMC109

Course Outcomes (CO):

1. CO1: Understand the fundamentals of object-oriented programming using Java.
2. CO2: Implement inheritance and polymorphism using Java.
3. CO3: Apply exception handling and package creation in Java applications.
4. CO4: Implement I/O operations and GUI programming.
5. CO5: Develop Java-based applications using collections, threads.

Instructions: - All questions are compulsory.

Question	CO	BL	Marks
Q1) a) Create a class Rectangle with constructors, accessor/mutator methods, and methods to compute area. Write a TestRectangle class to create and manage 5 Rectangle objects.	CO1	1	5 Marks
b) How Collection differs from an array? Write a program on ArrayList	CO1	1	5 Marks
Q.2) a) What is abstract class. Explain with an Example	CO2	2	5 Marks
b) What is Inheritance? Explain with an example	CO2	2	5 Marks
Q.3) a) Discuss different methods of the String class used for string manipulation.	CO3	3	5 Marks
b) What is an Interface and its advantages? Explain with an example	CO3	3	5 Marks
Q.4) a) Write a Java AWT program to create a window with a button. On clicking the button, it should show "Button Clicked!" message on a label OR	CO4	4	(10 marks)
Q.4) Write a Java AWT program with a checkbox and a label. Display "Checked" when the box is selected and "Unchecked" when it is deselected.	CO4	4	(10 marks)
Q.5) Design and implement a Java application to manage student records using classes and objects. Include fields like name, roll number, course, and marks in three subjects. Include methods to input data, compute total and average marks, and display student details. Apply the concepts of constructors, encapsulation, and arrays of objects.	CO5	5	(20 marks)
OR			
Q.5) Design a class BankAccount with methods for deposit, withdraw, and getBalance. Handle NegativeAmount and InsufficientFunds exceptions based on balance rules for savings and current accounts. LowSalException.	CO5	5	(20 marks)



SCHOOL OF COMPUTER APPLICATIONS

End-Semester Assessment – April/May- 2025

Program : Master of Computer Applications

Semester: II

Maximum Marks : 60 marks

Time: 3 hrs.

Course Name: Big Data Analytics

Course Code: PMC111

Course Learning Outcomes (CLOs):

1. To identify the usage of data on different big data ecosystems and understand Hadoop Components.
2. Demonstrate the Pig architecture and evaluation of pig scripts.
3. To describe the Hive architecture and execute SQL queries on sample data sets.
4. To apply knowledge of the process of transferring data between different file systems and to execute operations using sqoop.
5. To understand the concepts of indexing and use these concepts in Solr search engines. Implement and evaluate the data manipulation procedures using pig, hive, sqoop, Solr and develop an application.

Instructions:

1. All questions are compulsory.
2. Explain with example and Use diagrams wherever necessary.
3. Maintain clarity and structure in your answers.

Question	CLO	BTL	Marks																														
Q.1) Solve any 2(Each Question Carries 5 Marks) a) What is Hadoop? Explain its key components (HDFS, MapReduce, YARN) with their functions. b) What are the key challenges of Big Data? Explain any three in detail. c) List and explain any five sources of Big Data.	CLO1	1&2	(10 marks)																														
Q.2) Solve any 2(Each Question Carries 5 Marks) a) What are the different components of Pig? Explain the roles of Grunt and Pig Latin b) Filtering Transactions That Used Credit Card Payments Q: A company wants to analyze purchases made using a credit card. Write an Apache Pig script to extract all credit card transactions.	CLO2	2&3	(10 marks)																														
<table border="1"> <thead> <tr> <th>order_id</th> <th>customer_id</th> <th>product_category</th> <th>amount_spent</th> <th>payment_method</th> </tr> </thead> <tbody> <tr> <td>401</td> <td>1</td> <td>Electronics</td> <td>2000</td> <td>Credit Card</td> </tr> <tr> <td>402</td> <td>2</td> <td>Grocery</td> <td>1500</td> <td>Debit Card</td> </tr> <tr> <td>403</td> <td>3</td> <td>Electronics</td> <td>3000</td> <td>Credit Card</td> </tr> <tr> <td>404</td> <td>4</td> <td>Clothing</td> <td>4000</td> <td>UPI</td> </tr> <tr> <td>405</td> <td>5</td> <td>Electronics</td> <td>1000</td> <td>Credit Card</td> </tr> </tbody> </table>	order_id	customer_id	product_category	amount_spent	payment_method	401	1	Electronics	2000	Credit Card	402	2	Grocery	1500	Debit Card	403	3	Electronics	3000	Credit Card	404	4	Clothing	4000	UPI	405	5	Electronics	1000	Credit Card			
order_id	customer_id	product_category	amount_spent	payment_method																													
401	1	Electronics	2000	Credit Card																													
402	2	Grocery	1500	Debit Card																													
403	3	Electronics	3000	Credit Card																													
404	4	Clothing	4000	UPI																													
405	5	Electronics	1000	Credit Card																													
c) Discuss the benefits of parallel processing in Apache Pig.																																	

<p>Q.3) Solve any 2(Each Question Carries 5 Marks)</p> <p>a) Explain the different file formats in Hive (ORC, Parquet, Avro) and their impact on storage and query performance. Provide a practical use case.</p> <p>b) Consider a dataset with columns: product, category, amount, and city. Write HiveQL queries to:</p> <ul style="list-style-type: none"> - Create a partitioned and bucketed table - Insert data - Retrieve records using WHERE on partition and bucket columns. <p>c) Explain the concept of schema-on-read in Hive. Illustrate it using a practical HiveQL query and data scenario.</p>	CLO3	3	(10 marks)
<p>Q.4) Solve any 2(Each Question Carries 5 Marks)</p> <p>a) Describe the architecture of Sqoop and its key components.</p> <p>b) Write a command to import data from MySQL to HDFS.</p> <p>c) Explain the role of mappers in Sqoop. Analyze with an example what happens the number of mappers is changed.</p>	CLO4	3&4	(10 marks)
<p>Q.5) Evaluate how Solr's inverted index would be constructed from these documents. Then, demonstrate how the query machine AND medical would be processed. Build the inverted index, map terms to documents, and analyze the result.</p> <p>Doc1: "Machine learning improves medical diagnosis."</p> <p>Doc2: "Deep learning and neural networks are subfields of machine learning."</p> <p>Doc3: "Medical research uses artificial intelligence for analysis."</p> <p style="text-align: center;">OR</p> <p>You are provided with a CSV dataset named products.csv, containing resume records with the following structure:</p> <pre>id,name,skills,experience,location 101,Aarav,Java;AWS,4,Pune 102,Neha,Python;ML,2,Mumbai 103,Ishaan,AWS;DevOps,3,Bangalore</pre> <p>Using this data, demonstrate how indexing is performed in Solr.</p>	CLO5	5	(20 marks)



Learn | Grow | Achieve

PCCU'S
Pimpri
Chinchwad
University

Pimpri Chinchwad University

Established under Govt. of Maharashtra Act No. V of 2023
Sate, Maval (PMRDA) Dist - Pune, Maharashtra - 412 106.



039

SCHOOL OF COMPUTER APPLICATIONS

End-Semester Assessment – April/May- 2025

Program : MCA

Semester: II

Maximum Marks: 60 marks

Time: 2.5 hrs.

Course Name: Computer Networks

Course Code: PMC113 A / MAJE

Course Learning Outcomes (CLOs):

1. Students will be able to Interpret the different building blocks of the Communication network and its architecture.
2. Students will be able to apply different types of switching networks and analyze the performance of network
3. Students will be able to Understand and explain the Data Communications System and its components by using different types of network topologies and protocols.
4. Students will be able to enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Students will be able to Identify the different types of network devices and their functions within a network

Instructions:

- All questions are compulsory.
- Figures to be right indicate full marks. etc.

Question	CLO	BTL	Marks
Q.1) Solve any 1 (Each Question Carries 10 Marks) a) Explain the OSI reference model in detail, describing the function and responsibilities of each of its seven layers. Compare OSI Reference Model and TCP/IP. b) Write short notes (Any 2) 1. Guided Media 2. Connection oriented and Connectionless 3. TDM & FDM	CLO1	1	(10 marks)
Q.2) Solve any 1 (Each Question Carries 10 Marks) a) 1. Explain the role of communication satellites in wireless transmission. Discuss their applications, advantages, and limitations in modern communication networks? 2. Identify and explain the key design issues of the Data Link Layer in the OSI model. b) A bit stream 10110011 is transmitted using the standard CRC method. The generator polynomial is x^4+x+1 . What is the actual bit string transmitted?	CLO2	2	(10 marks)
Q.3) Solve any 2 (Each Question Carries 5 Marks) a) Explain the role of elementary data link protocols in ensuring reliable data transmission. Provide examples of commonly used protocols.	CLO3	3	(10 marks)

<p>b) Describe the working principles of Stop-and-Wait Protocol and Go-Back-N Protocol. Highlight their advantages and limitations.</p> <p>c) Explain the concept of Elementary Data Link Protocol (EDLP) and discuss its role in ensuring error-free communication in data transmission. Provide an example of where it is used.</p>			
<p>Q.4) Solve any 2 (Each Question Carries 5 Marks)</p> <p>a) Explain the primary functions of the Network Layer in the OSI model. How does it handle data packet routing and addressing?</p> <p>b) Explain the concept of IP address classes and how subnet masking is used to divide a network into smaller subnets.</p> <p>c) What is the Address Resolution Protocol (ARP)?</p>	CLO4	4	(10 marks)
<p>Q.5) Solve any 2 (Each Question Carries 10 Marks)</p> <p>a) Explain the design issues in the transport layer. How do transport layer addressing and multiplexing contribute to reliable data transmission?</p> <p>b) Compare TCP and UDP. Discuss how the transport layer ensures reliable data delivery.</p> <p>c) Describe the process of connection establishment and connection release in TCP. Explain the significance of the TCP header fields used during these processes.</p>	CLO5	5	(20 marks)

38290

NotesSociety



SCHOOL OF COMPUTER APPLICATIONS

End-Semester Assessment – April/May- 2025

Program : MCA

Semester: II

Maximum Marks: 60 marks

Time: 3 hrs.

Course Name: Optimization Techniques

Course Code: PMC114 / BSC

Course Learning Outcomes (CLOs):

1. To Understand the role and principles of optimization techniques in business world (Understand)
2. To Demonstrate specific optimization technique for effective decision making (Apply)
3. To Apply the optimization techniques in business environments (Apply)
4. To Illustrate and infer for the business scenario (Analyze)
5. To Analyze the optimization techniques in strategic planning for optimal gain. (Analyze)

Question	CLO	BTL	Marks																				
<p>Q.1) Solve any One</p> <p>a) 1. A company owns two flour mills A and B, which have different production capacities for high, medium and low quality flour. The company has entered a contract to supply flour to a firm every month with at least 8, 12 and 24 quintals of high, medium and low quality respectively. It costs the company Rs 2000 and Rs 1500 per day to run mill A and B respectively. In one day, Mill A produces 6, 2 and 4 quintals of high, medium and low quality flour respectively, Mill B produces 2, 4 and 12 quintals of high, medium and low quality flour respectively. Formulate the linear programming model to Minimize the cost.</p> <p>2. Find solution using graphical method $MIN z = 20x_1 + 10x_2$ subject to $x_1 + 2x_2 \leq 40$ $3x_1 + x_2 \geq 30$ $4x_1 + 3x_2 \geq 60$ and $x_1, x_2 \geq 0$</p> <p>OR</p> <p>b) Find solution using Two-Phase method $MAX Z = 5x_1 + 8x_2$ subject to $3x_1 + 2x_2 \geq 3$ $x_1 + 4x_2 \geq 4$ $x_1 + x_2 \leq 5$ and $x_1, x_2 \geq 0$</p>	CLO1	B3	(5 * 2 marks)																				
<p>Q.2) Solve any One</p> <p>a) Find Solution using Vogel's Approximation method, also find optimal solution using modi method,</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th>D1</th> <th>D2</th> <th>D3</th> <th>Supply</th> </tr> </thead> <tbody> <tr> <td>S1</td> <td>8</td> <td>5</td> <td>6</td> <td>120</td> </tr> <tr> <td>S2</td> <td>15</td> <td>10</td> <td>12</td> <td>80</td> </tr> <tr> <td>S3</td> <td>3</td> <td>9</td> <td>10</td> <td>80</td> </tr> </tbody> </table>		D1	D2	D3	Supply	S1	8	5	6	120	S2	15	10	12	80	S3	3	9	10	80	CLO2	B4	(10 marks)
	D1	D2	D3	Supply																			
S1	8	5	6	120																			
S2	15	10	12	80																			
S3	3	9	10	80																			

Demand	150	80	50	
--------	-----	----	----	--

OR

b) Find Solution using North West Corner Method, Least cost Method, Voggel's Approximation method (Maximization)

	D1	D2	D3	D4	D5	Supply
S1	5	8	6	6	3	8
S2	4	7	7	6	5	5
S3	8	4	6	6	4	9
Demand	4	4	5	4	8	

Q.3) Solve any One

a) 1. Find Solution of Travelling salesman problem (MIN case)

Work\Job	A	B	C	D	E
A	x	5	8	4	5
B	5	x	7	4	5
C	8	7	x	8	6
D	4	4	8	x	8
E	5	5	6	8	x

a) 2. Write a note in detailed on Hungarian method

CLO3 B4 (5 * 2 marks)

OR

b) Find Solution of Travelling salesman problem using diagonal completion method (MIN case)

Work\Job	A	B	C	D
A	5	3	2	8
B	7	9	2	6
C	6	4	5	7
D	5	7	7	8

Q.4) Solve any 1(Q 1 (a) carrying 5 marks for each question)

a) 1. Critical path, Total float, Free float, Independent float

A	-	4
B	-	3
C	A,B	2
D	A,B	5
E	B	6

CLO4 B5 (5*2 marks)

F	C	4
G	D	3
H	F,G	7
I	F,G	4
J	E,H	3

a) 2. Write difference on PERT And CPM

OR

b) Assume the following project data given in Table 7.1. It is required to crash the project duration from its original duration to a final duration of 110 days. Assume daily indirect cost of LE 100.

Activity	Normal time (Days)	Normal Cost (Rs)	Crash time (Days)	Crash time (Rs)
1-2	6	600	4	750
2-3	5	400	4	450
2-5	6	1200	3	1650
2-4	7	1000	4	1360
3-5	10	500	8	550
5-6	5	800	4	910
4-6	4	1500	3	1660

Q5) a) Explain the concept and importance of Decision Analysis. How does it aid in managerial decision-making? Illustrate your answer with a suitable real-life example.

B) Solve this example decision under uncertainty.

	N1	N2	N3	N4
S1	1000	1500	750	0
S2	250	2000	3750	3000
S3	-500	1250	3000	4750
S4	-1250	500	2250	4000

OR

b) Write a note on Decision making process under uncertainty in detailed and solve this example

Example: A manufacturer of laptops is faced with the problem of selecting one of the 2 models to be manufactured. Profit or losses expected by the management from the 4 different categories are as follows:

Course of action	State of Nature		
	A1	65	0
A2	0	55	60
A3	76	-15	80

CLO5

B6

(10*2 marks)

CLO5

B6

(20 marks)