

Day : Friday

Date : 21/11/2025

W-26289-2025

Time : 02:00 PM-05:00 PM

Max. Marks : 60

Date:

NB :

1. Answers to Section I, II and III should be written in same answer book.
2. Section -I (MCQ) all sub-questions of Q. No. 1 are COMPULSORY, write the sub-question no. and the chosen alternative (eg. 1b, 2c) in the answer book.
3. Section-I (MCQ) is of 10 marks and Section-II and onwards are of 50 marks.

SECTION - I

Q. 1

MCQs

- 1) Which measure of central tendency is most affected by extreme values (outliers)? (1)
 - a) Mean
 - b) Median
 - c) Mode
 - d) Standard Deviation
- 2) If two variables oppose each other, the correlation will be: (1)
 - a) Positive
 - b) Zero
 - c) Negative
 - d) Perfect
- 3) The square of the standard deviation is called the: (1)
 - a) Mean
 - b) Range
 - c) Variance
 - d) Quartile Deviation
- 4) Tabulation helps in: (1)
 - a) Comparison of data
 - b) Data analysis
 - c) Presenting data neatly
 - d) All of the above
- 5) The process of grouping data into different classes or subclasses is called: (1)
 - a) Tabulation
 - b) Data entry
 - c) Classification
 - d) Data interpretation
- 6) Which of the following is the value that appears most frequently in a data set? (1)
 - a) Mean
 - b) Median
 - c) Mode

d) Range

- 7) Which of the following techniques is an analysis of the relationship between two variables to help provide the prediction mechanism? (1)
a) Standard error
b) Correlation
c) Regression
d) None of the above
- 8) Measures of dispersion can never be: (1)
a) Positive
b) Zero
c) Negative
d) Equal to 2
- 9) If the correlation coefficient (r) is 0.48, it represents a: (1)
a) Large effect size
b) Medium effect size
c) Small effect size
d) None of the above
- 10) In simple regression equation, the numbers of variables involved are: (1)
a) 0
b) 1
c) 2
d) 3

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)**B.C.A. Sem-III : WINTER 2025****SUBJECT: STATISTICS**

Day : Friday

Date : 21/11/2025

W-26289-2025

Time : 02:00 PM-05:00 PM

Max. Marks : 60

Date:

NB :

1. Figures to the right indicate FULL marks.
2. Section – III - Attempt any ONE question. Each questions carries 10 marks.
3. Section – II - Attempt any FIVE questions. Each questions carries 08 marks.

SECTION - II

- Q. 2 a) Explain steps in calculating rank correlation. In which cases rank correlation coefficient is applied over Karl Pearson's Coefficient. (8)

b) Calculate rank correlation for the following data known – Sum of squares of differences in ranks=25.5, N=10. Item 20 is repeated 4 times and another item 22 is repeated 3 times for X series while 24 is repeated 2 times for Y series

- Q. 3 Represent following data graphically using frequency polygon, histogram and ogive curves. (8)

X	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Y	150	300	500	800	1000	900	400	100

- Q. 4 Calculate standard deviation and coefficient of variation for the following data and comment accordingly. (8)

X : Salary per month in thousand

Y : Number of families

X	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Y	60	45	120	25	90	80	120	60

- Q. 5 For the following raw data representing heights of 50 students calculate mean and median after tabulating data with suitable class intervals. (8)

67	73	71	74	61	68	72	69	71	69
70	70	66	73	68	67	72	71	77	69
66	68	70	72	72	70	76	70	71	74
71	70	64	65	70	69	72	75	66	67
67	70	71	68	66	73	70	72	69	67

- Q. 6 a. Coefficient of Variation of a series is 60 and standard deviation is 20. What is its mean? (8)

- b. The mean and the variance of a distribution are 79 and 5 respectively. Calculate the coefficient of variation.

- Q. 7 c. Attempt ANY TWO of the following: (Short Notes) (4x2)
- Sources of Data
 - Mode as a measure of central tendency
 - Merits and demerits of standard deviation.

SECTION - III

- Q. 8 Define Regression Equation of Y on X and Y on X for the following data. (10)

X	3	5	5	4	8	12
Y	18	14	12	10	9	7

- Q. 9 a) What is correlation? How correlation coefficient is interpreted? (10)
- b) Calculate Rank correlation for following marks assigned by to examiners.

R.No.	1	2	3	4	5	6	7	8	9	10
A	24	29	19	14	30	19	27	30	20	28
B	37	35	16	26	23	27	19	20	16	11

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

Day : Wednesday
Date : 19/11/2025

W-26288-2025

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

NB :

1. Answers to Section I, II and III should be written in same answer book.
2. Section -I (MCQ) all sub-questions of Q. No. 1 are COMPULSORY, write the sub-question no. and the chosen alternative (eg. 1b, 2c) in the answer book.
3. Section-I (MCQ) is of 10 marks and Section-II and onwards are of 50 marks.

SECTION - I

- Q. 1 MCQs
- 1) Which of the following statements about Java arrays is correct? (1)
A. Arrays can store elements of different data types
B. Array size can be changed dynamically
C. Arrays are objects in Java
D. Array indices start from 1
 - 2) What is the output of the following code? (1)

```
String s = "Java";  
System.out.println(s.length());
```


A. 3
B. 4
C. 5
D. Compilation Error
 - 3) Which of the following allows runtime polymorphism in Java? (1)
A. Method Overloading
B. Final Methods
C. Method Overriding
D. Static Methods
 - 4) Which keyword is used to implement an interface? (1)
A. extends
B. implements
C. interface
D. super
 - 5) Which of the following is the parent class of all Java classes? (1)
A. String
B. Object
C. Class
D. System
 - 6) Which of the following statements is true about the final keyword? (1)
A. final methods can be overridden
B. final variables can be reassigned

- C. final classes cannot be inherited
- D. final classes cannot be instantiated

- 7) Which of the following I/O classes is used to write characters to a file? (1)
A. FileOutputStream
B. FileWriter
C. FileInputStream
D. Scanner
- 8) Which of the following GUI classes belongs to Swing and not AWT? (1)
A. Button
B. Label
C. JTextField
D. TextArea
- 9) Which method of the Applet class is used to perform drawing operations? (1)
A. start()
B. init()
C. paint()
D. stop()
- 10) Which of the following is true about exception handling in Java? (1)
A. All exceptions must be caught
B. try block must be followed by catch
C. finally block always executes whether exception occurs or not
D. Exceptions cannot be user-defined

* * * * *

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

Day : Wednesday
Date : 19/11/2025

W-26288-2025

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

NB :

1. Figures to the right indicate FULL marks.
2. Section – III - Attempt any ONE question. Each questions carries 10 marks.
3. Section – II - Attempt any FIVE questions. Each questions carries 08 marks.

SECTION - II

- | | | |
|------|--|-------|
| Q. 2 | Describe garbage collection mechanism in Java. | (8) |
| Q. 3 | Explain the concept of arrays and array of objects with examples. | (8) |
| Q. 4 | Explain function overloading with a suitable example. | (8) |
| Q. 5 | Explain the concept of abstract classes and interfaces in Java. | (8) |
| Q. 6 | Explain the use of FileInputStream and FileOutputStream classes with example code. | (8) |
| Q. 7 | Attempt ANY TWO of the following: (Short Notes) | (4x2) |
| | a) Static and Final keywords. | |
| | b) Types of Inheritance | |
| | c) AWT Components. | |

SECTION - III

- | | | |
|------|---|------|
| Q. 8 | Write a Java Applet program to display a List and a set of Checkboxes for different fruits. The applet should show these controls without any event handling. | (10) |
| Q. 9 | Write a Java program to count the number of words in a text file. | (10) |

* * * * *

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)
B.C.A. Sem-III : WINTER: 2025
SUBJECT: SOFTWARE ENGINEERING

Day : Monday
Date : 17/11/2025

W-26287-2025

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

NB :

1. Answers to Section I, II and III should be written in same answer book.
2. Section -I (MCQ) all sub-questions of Q. No. 1 are COMPULSORY, write the sub-question no. and the chosen alternative (eg. 1b, 2c) in the answer book.
3. Section-I (MCQ) is of 10 marks and Section-II and onwards are of 50 marks.

SECTION - I

- Q. 1 MCQs
- 1) Which of the following is *not* a principle of software engineering? (1)
A. Modularity
B. Abstraction
C. Spaghetti code
D. Incrementality
 - 2) In a software development, which role writes the SRS? (1)
A. Tester
B. Requirements analyst / software engineer
C. DBA
D. Hardware engineer
 - 3) Operational feasibility evaluates: (1)
A. Cost vs benefits
B. Whether system fits into existing operations
C. Technology compatibility
D. Legal constraints
 - 4) The waterfall model is criticized because: (1)
A. It's too flexible
B. It's expensive
C. It does not accommodate changing requirements easily
D. It ignores testing
 - 5) Which method is a modern elicitation technique? (1)
A. Brainstorming
B. Prototyping
C. Interview
D. Questionnaire

- 6) A well-formed SRS is **traceable** means: (1)
A. You can track each requirement to design, code, tests
B. It is versioned
C. It is modifiable
D. It is understandable
- 7) Decision tree is particularly helpful when: (1)
A. Data modeling
B. Representing decision logic in hierarchical fashion
C. Module decomposition
D. Version control
- 8) Cohesion relates to: (1)
A. Inter-module interaction
B. Internal unity of a module
C. Number of lines of code
D. Test coverage
- 9) Which of these is a type of white-box testing? (1)
A. Equivalence partitioning
B. Statement coverage
C. Boundary value analysis
D. User acceptance
- 10) The purpose of SQA plan is to: (1)
A. Guide how quality will be ensured for the software
B. Replace testing entirely
C. Eliminate documentation
D. Focus only on project cost

* * * * *

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)

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

SUBJECT: SOFTWARE ENGINEERING

Day : Monday

Date : 17/11/2025

W-26287-2025

Time : 02:00 PM-05:00 PM

Max. Marks : 60

NB :

1. Figures to the right indicate FULL marks.
2. Section – III - Attempt any ONE question. Each questions carries 10 marks.
3. Section – II - Attempt any FIVE questions. Each questions carries 08 marks.

SECTION - II

- Q. 2 Explain the Verification and Validation process in Requirement Engineering. Why are both crucial for quality of the software? (8)
- Q. 3 What is Software Testing? Explain various levels of software testing in detail. (8)
- Q. 4 Explain the Spiral Model in detail. Discuss its advantages and the scenarios where it is most appropriately used. (8)
- Q. 5 State various requirement elicitation techniques used in Requirement Engineering Process? (8)
- Q. 6 Explain the concept of Feasibility Study in the software development Process. State different types of feasibility studies conducted in software development. (8)
- Q. 7 Attempt ANY TWO of the following: (Short Notes) (4x2)
- a) Formal Technical Review
 - b) Software Characteristics
 - c) BlackBox Testing

SECTION - III

- Q. 8 A clinic manages its outpatient department. Patients schedule appointments with doctors. During the visit, the doctor diagnoses the patient and may prescribe medicines or tests. The (10)

system generates prescriptions and lab test requests. The billing department creates bills based on consultation fees, tests, and medicines. Create the Context Level DFD, Level 1 DFD for the clinic's outpatient management.

- Q. 9 "Aroma Fine Dining" restaurant needs a system. Waiters take customer orders directly on a tablet, which sends the order to the kitchen and the bar. The kitchen staff marks orders as completed. The system generates the bill, which includes itemized orders and taxes. The manager can add/remove menu items and view daily sales summaries. Model this system with an ERD. Mention relationship and cardinality. (10)

* * * * *

171125-e-iom-kolhapur

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)

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

SUBJECT: OPERATING SYSTEMS

Day : Saturday

Date : 15/11/2025

W-26286-2025

Time : 02:00 PM-05:00 PM

Max. Marks : 60

NB :

1. Answers to Section I, II and III should be written in same answer book.
2. Section -I (MCQ) all sub-questions of Q. No. 1 are COMPULSORY, write the sub-question no. and the chosen alternative (eg. 1b, 2c) in the answer book.
3. Section-I (MCQ) is of 10 marks and Section-II and onwards are of 50 marks.

SECTION - I

Q. 1 MCQs

- 1) Virtual memory is divided into allocation units of the same size called as _____ (1)
 1. Pages
 2. Page frames
 3. Blocks
 4. Faults
- 2) A program under execution is called _____ (1)
 1. A Paging
 2. A process
 3. A virtual Memory
 4. A demand Page
- 3) An incremental backup is..... (1)
 1. Taken once in the week
 2. Taken Daily
 3. Saves all the files every time
 4. Saves only files that have recently changed
- 4) File type can be represented by _____ (1)
 1. File name
 2. File Extension
 3. File Identifier
 4. file Size
- 5) First-in-First-Out (FIFO) scheduling is _____ (1)
 1. Non Preemptive Scheduling
 2. Preemptive Scheduling
 3. Fair share Scheduling
 4. Deadline Scheduling
- 6) In multilevel feedback scheduling algorithm.... (1)
 1. a process can move to a different classified ready queue
 2. a classification of ready queue is permanent
 3. a processes are not classified into groups
 4. none of the above

- 7) It is known as the core part of the Operating System..... (1)
1. Kernel
 2. Application program
 3. Interpreter
 4. Assembler
- 8) Semaphore is a/an _____ to solve the critical section problem. (1)
1. Special System Program
 2. Variable
 3. Double Variable
 4. None of the Above
- 9) The Bankers algorithm is used..... (1)
1. To rectify deadlock
 2. To detect deadlock
 3. To prevent deadlock
 4. Identify the deadlock
- 10) To avoid the race condition, the number of processes that may be simultaneously inside their critical section is... (1)
1. 8
 2. 1
 3. 16
 4. 0

151125-e-iom-kolhapur

BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2022 COURSE)
B.C.A. Sem-III : WINTER: 2025
SUBJECT: OPERATING SYSTEMS

Day : Saturday
Date : 15/11/2025

W-26286-2025

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

NB :

1. Figures to the right indicate FULL marks.
2. Section – III - Attempt any ONE question. Each questions carries 10 marks.
3. Section – II - Attempt any FIVE questions. Each questions carries 08 marks.

SECTION - II

- Q. 2 What is Operating System? Discuss various components of operating systems. Also give the functions of operating systems. (8)
- Q. 3 What do you mean by process control block? Discuss the importance of PCB. Give the content of it. (8)
- Q. 4 Why memory management? Explain the memory management with bit map and linked list with their merits and demerits. (8)
- Q. 5 What is producer consumer problem? Explain the bounded buffer problem and provide the solution with help of semaphore. (8)
- Q. 6 What is a file system? Explain about file system security. (8)
- Q. 7 Attempt ANY TWO of the following: (Short Notes) (4x2)
- a) Users View of Operating System
 - b) Clock page replacement algorithm
 - c) Interrupt handler

SECTION - III

- Q. 8 Consider the following case. All the processes are arrived at 10.00 am. (10)

Job No.	Priority	Run Time (min)
P1	3	8
P2	1	9
P3	4	3
P4	2	5

Calculate average waiting time and turnaround time in case of:

- a) SJF b) PBPS

Q. 9

Consider the disk having 150 tracks, numbered 1 to 150. Currently head is on track number 50 and moving outside. Following is the queue of requests kept in the FIFO order. (10)

50, 91, 150, 42, 130, 18, 140, 70, 60

Calculate total time required to move all these tracks using following disk scheduling algorithms. Consider Seek time=0.45 sec.

i) FCFS

ii) SSTF

* * * * *

151125-e-iom-kolhapur