

[4]

- ii. Explain the concept of event listener interfaces in Java. Provide examples to demonstrate the usage of each listener interface. **5**
- iii. Explain the usage of JLabel, JTextField, and JButton components in Java Swing for building graphical user interfaces. Provide examples to demonstrate how each component can be used. **5**

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Total No. of Questions: 6

Total No. of Printed Pages:4

Enrollment No.....



Faculty of Science / Engineering  
End Sem Examination May-2024  
CA3CO14 Object Oriented Technology

Programme: BCA /BCA- MCA (Integrated) Branch/Specialisation: Computer Application

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

- Q.1 i. Which of the following data types in Java is used to represent characters? **1**  
(a) String (b) int (c) char (d) boolean
- ii. Which of the following statements best describes the Java Runtime Environment (JRE)? **1**  
(a) JRE is responsible for compiling Java source code into bytecode  
(b) JRE provides tools for Java application development, such as IDEs and compilers  
(c) JRE is a set of tools for debugging and profiling Java applications  
(d) JRE is a software package that includes the JVM and libraries required to run Java applications
- iii. Which of the following principles of object-oriented programming emphasizes the bundling of data and methods that operate on the data within a single unit? **1**  
(a) Inheritance (b) Encapsulation  
(c) Polymorphism (d) Abstraction
- iv. What does the following code print? **1**  

```
String str = "abcde";  
str.trim();  
str.toUpperCase();  
str.substring(3, 4);  
System.out.println(str);
```

  
(a) CD (b) CDE (c) D (d) abcde

P.T.O.

[2]

- v. Which of the following statements about checked and unchecked exceptions in Java is correct? **1**
- (a) Checked exceptions must be handled using a try-catch block or declared in the method signature, while unchecked exceptions do not require such handling
- (b) Unchecked exceptions must be handled using a try-catch block or declared in the method signature, while checked exceptions do not require such handling
- (c) Both checked and unchecked exceptions must be handled using a try-catch block or declared in the method signature
- (d) Neither checked nor unchecked exceptions need to be handled explicitly; they are automatically handled by the JVM
- vi. Which of the following methods is used to pause the execution of a Java thread for a specified amount of time? **1**
- (a) yield() (b) wait()
- (c) sleep() (d) notify()
- vii. Which layout manager in AWT arranges components in a grid of rows and columns, where each cell in the grid is of the same size? **1**
- (a) BorderLayout (b) FlowLayout
- (c) GridLayout (d) CardLayout
- viii. Which method is used to add a component to a container in Java AWT? **1**
- (a) addComponent(Component comp)
- (b) addElement(Component comp)
- (c) add(Component comp)
- (d) insert(Component comp)
- ix. Which interface is used to handle action events in Java AWT? **1**
- (a) ActionListener (b) MouseListener
- (c) KeyListener (d) WindowListener
- x. Which Swing component is used to display text and images in a scrollable area with horizontal and/or vertical scrollbars? **1**
- (a) JLabel (b) JTextArea
- (c) JScrollPane (d) JPanel
- Q.2 i. What are the three categories of Java variables based on their scope and lifetime? **2**
- ii. Explain the individual use of the break and continue statements in Java with an example for each. **3**

[3]

- iii. Discuss the different data types available in Java and their sizes in terms of memory allocation. **5**
- OR iv. Explain the concept of decision-making in Java with examples of the if-else and switch statements. **5**
- Q.3 i. What is the purpose of a constructor in Java? How does it differ from methods in a class? **2**
- ii. Explain the concept of inheritance in Java, and discuss the types, advantages and disadvantages of using inheritance in object-oriented programming. **8**
- OR iii. Define a superclass Vehicle with attributes make and model, and methods start() and stop(). Define subclasses Car and Motorcycle. The Car subclass should have an additional attribute numDoors and override the start() method. The Motorcycle subclass should have an additional attribute engineSize and override the stop() method. Write the classes and a simple program to demonstrate their functionality. **8**
- Q.4 i. Explain the difference between checked and unchecked exceptions in Java and provide examples of each. **3**
- ii. Explain the Java thread model, including the concept of thread priorities, synchronization, and the Runnable interface. Provide examples to illustrate each concept. **7**
- OR iii. Explain the concept of exception handling in Java, including the try-catch-finally blocks, the throws keyword, and creating custom exceptions. Provide examples to illustrate each aspect. **7**
- Q.5 i. What are layout managers in Java AWT? Write the differences between FlowLayout, GridLayout, BorderLayout, and CardLayout. Provide examples to illustrate the usage of each layout manager. **4**
- ii. Explain the concept of AWT Controls. Write the differences between Labels, Buttons, and Checkboxes. Provide examples to illustrate the usage of each control. **6**
- OR iii. Explain the Java AWT class hierarchy with a diagram. **6**
- Q.6 Attempt any two: **5**
- i. List out the differences between AWT and Swing. **5**

**Marking Scheme****Object Oriented Technology (T) - CA3CO14 (T)**

- i. (c) char
- ii. (d) JRE is a software package that includes the JVM and libraries required to run Java applications.
- iii. (b) Encapsulation
- iv. (d) abcde
- v. (a) Checked exceptions must be handled using a try-catch block or declared in the method signature, while unchecked exceptions do not require such handling.
- vi. (c) sleep()
- vii. (c) GridLayout
- viii. (c) add(Component comp)
- ix. (a) ActionListener
- x. (c) JScrollPane

Q.2	I. For correctly .....scope:	1 Mark	Q.2
	for correctly .....category	1 Mark	
	II. For explaining the purpose of the break statement	1 Mark	
	For explaining the purpose of the continue statement	1 Mark	
	For providing an example for each statement	1 Mark	
	III. For listing and discussing primitive data types	1 Mark	
	For explaining the sizes of primitive data types	1 Mark	
	For discussing the .... reference data types	1 Mark	
	For discussing the size of reference data types	2 Mark	
	OR IV. for defining decision-making in Java	1 Mark	
OR	for explaining the if-else statement	1 Mark	OR
	for explaining the switch statement	1 Mark	
	for example code .....switch statement	2 Mark	
Q.3	I. for explaining the purpose of a constructor:	1 Mark	Q.3
	for highlighting .....	1 Mark	
	II. for defining inheritance in Java	1 Mark	
	for discussing the types of inheritance	1 Mark	
	for explaining the advantages of using inheritance	3 Marks	
	for discussing the disadvantages of using inheritance	3 Marks	

OR	iii	for defining ..... and stop()	1 Mark	OR
		for defining the subclasses Car and Motorcycle	1 Mark	
		for adding .....Motorcycle	1 Mark	
		for overriding metho.....	2 Marks	
		for demonstrating ..... program	3 Marks	
Q.4	I.	for explaining checked exceptions	1 Mark	Q.4
		for explaining unchecked exceptions	1 Mark	
		for providing examples of each type of exception	1 Mark	
		II. for explaining the Java thread model	1 Mark	
		for explaining thread priorities and synchronization	2 Marks	
		for explaining the Runnable interface	2 Marks	
		for providing examples to illustrate each concept	2 Marks	
		OR III. for explaining ..... handling	1 mark	
		for explaining the try-catch-finally blocks	2 marks	
		for explaining the throws keyword	1 mark	
		for explaining creating custom exceptions	2 marks	
		for providing examples to illustrate each aspect	1 mark	
Q.5	I.	for explaining layout managers in Java AWT	1 Mark	Q.5
		for writing the differences..... CardLayout	2 Marks	
		for providing examples to ..... manager	1 Mark	
		II. for explaining the concept of AWT Controls	1 Mark	
		for discussing the ....., and Checkboxes:	2 Marks	
		for providing exa..... control:	3 Marks	
OR	III.	for providing an ..... hierarchy:	1 Mark	OR
		for describing the major ..... hierarchy:	2 Marks	
		for providing a diagram ..... class hierarchy	2 Marks	
Q.6	I.	for explaining the AWT and Swings technology.	1 Mark	Q.6
		for listing the differences between AWT and Swing:	2 Marks	
		for providing examples to illustrate the difference	2 Marks	
		II. for explaining the ..... or Swing:	1 Mark	
		for discussing ..... interfaces	2 Marks	
		for providing examples to ..... interface:	2 Marks	
	III.	for explaining t..... JButton components:	2 Mark	
		for providing example.....nent can be used:	3 Marks	

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