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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: III**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 22CS3PCOOJ **Max Marks: 100**
Course: Object Oriented Java Programming

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	*CO*	*PO*	Marks
1	a)	Write a Java program that overloads the method area() to calculate area of circle when one double parameter is passed, calculate area of square when one int parameter is passed and calculate area of rectangle when two parameters are passed.	*3*	*3*	**7**
	b)	Write a Java program to accept the principal(P), rate of interest(R) and time(T) from the user as command line arguments. Print the simple interest using the formula PTR/100.	*3*	*3*	**7**
	c)	Elaborate on the following with valid code snippets. i. static block and static variable ii. this keyword	*1*	*1*	**6**
		OR			
2	a)	Demonstrate type conversion and typecasting by applying them in an appropriate example program	*1*	*1*	**5**
	b)	Create a class Book with instance members book_id, book_name, number of pages, publisher_id and price. Write a program to create an array of n books objects. Include methods that display the following according to the requirement given below i. Name and ID of the book which is the most expensive one ii. Name and ID of the book published by a given publisher_id NOTE: Accept the input from the user	*3*	*3*	**10**
	c)	Write a snippet demonstrating the two dimensional array with the following output 1 2 3 4 5 6 7 8 9 10	*2*	*2*	**5**
		UNIT - II			
3	a)	Write a Java program to create an abstract class BankAccount with abstract methods deposit() and withdraw(). Create subclasses:	*3*	*3*	**7**

			SavingsAccount and CurrentAccount that extend the BankAccount class and implement the respective methods to handle deposits and withdrawals for each account type.			
		b)	Demonstrate dynamic method dispatch with a valid code.	*3*	*3*	**7**
		c)	Describe the use of the final keyword on class, method and variable using a suitable code.	*1*	*1*	**6**
			OR			
	4	a)	Write a java program to create an abstract class called Employee with variables such as emp_id, emp_name and salary and a method calculate_salary(). Derive two classes Permanent Employee and Temporary Employee from Employee class which includes method to set and get details of the employee. Test the classes defined demonstrating dynamic methods dispatch. Demonstrate anyone of the uses of super keywork	*2*	*2*	**10**
		b)	Differentiate between String and String Buffer	*2*	*2*	**5**

		c)	Identify and write correct the code
			
			public static String **getReverseString**(String str){
			
			StringBuffer strBuffer = **new** StringBuffer(str.length);
			for(**int** counter= ; counter>=0;){
			strBuffer.append()
			}
			return strBuffer;
			}
				2	*2*	**5**

			UNIT - III			
	5	a)	Write a Java program to create an interface Playable with a method play() that takes no arguments and returns void. Create three classes Football, Volleyball, and Basketball that implement the Playable interface and override the play() method to play the respective sports.	*3*	*3*	**10**
		b)	Write a Java program to create a method that takes a string as input and throws an exception if the string does not contain vowels.	*3*	*3*	**10**
			OR			
	6	a)	Write a Java program to create an interface Drawable with a method draw() that takes no arguments and returns void. Create three classes Circle, Rectangle, and Triangle that implement the Drawable interface and override the draw() method to draw their respective shapes.	*3*	*3*	**10**
		b)	Write a Java program that reads a list of integers from the user and throws an exception if any numbers are duplicates.	*3*	*3*	**10**
			UNIT - IV			
	7	a)	Elaborate on any 5 methods of the Thread class. Show their application in a code.	*1*	*1*	**10**

		b)	Create two threads, one to print prime numbers in a range and another to print Fibonacci series. Ensure that these threads run synchronously.	*3*	*3*	**10**
			OR			
	8	a)	Write a multithreaded program to obtain the output in the following order using threads using synchronization [BMSCE] [RVCE] [PESIT]	*3*	*3*	**10**
		b)	Create a program to manage bank account transactions. Define an user defined exception InsufficientFundsException that is thrown when a withdrawal amount exceeds the available balance	*3*	*3*	**10**
			UNIT - V			
	9	a)	Write a Java code using to generate the image below. 	*3*	*3*	**7**
		b)	Elaborate on the Delegation Event model.	*1*	*1*	**6**
		c)	Write a Java program to handle mouse events which includes - any four under Mouse Listener and two under Mouse Motion Listener.	*3*	*3*	**7**
			OR			
	10	a)	Write a Java code using to generate the image below. 	*3*	*3*	**7**
		b)	Generate a frame using Java AWT. When the user clicks within the frame, a red filled circle and a yellow filled rectangle should be displayed.	3	*3*	**7**
		c)	Elaborate on any 4 event classes in java.	*1*	*1*	**6**

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