CLASS: BE   SEMESTER : III/ADD
BRANCH: CSE   SESSION : MO/17

SUBJECT: CS3005 OBJECT ORIENTED PROGRAMMING USING JAVA

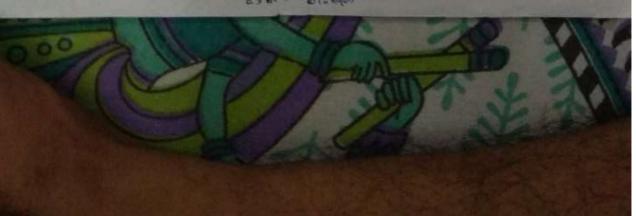TIME: FULL MARKS: 60

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)   In the context of object oriented programming what do you understand by the concept of polymorphism? [2]

Q.1(b)   Why does a java source code file contain only a single public class and why does the name of the source file must match that of the public class? [4]

Q.1(c)   What is the specific roles played by the executables javac and java and the JVM in executing a JAVA program. [6]

Q.2(a)   Describe two different for loop structures available in the current editions of JAVA. [2]

Q.2(b)   Write a program in Java to find the mean value of a two-dimensional array of floats. The array contains three rows where each row contains K columns. The number of columns in a row is to be obtained as an input from the user along with the elements of the array. [4]

Q.2(c)   Write a O(N) recursive program in Java to find the largest element in an array. [6]

Q.3(a)   Differentiate between the terms overloading and overriding in the context of JAVA [2]

Q.3(b)   Use code snippets to demonstrate the difference between nested try catch structures and try blocks with multiple catch blocks. [4]

Q.3(c)   Write a program that creates an abstract class Shape. Derive classes Circle and Square from the abstract class Shape. How would you print the name of the shape of an object (e.g. "Circle", "Square"), if you are not allowed to make any reference variables of the derived classes but are required to make instances of the derived classes? [6]

Q.4(a)   How do we use the Runnable interface to spawn a new thread? Explain with a code snippet. [2]

Q.4(b)   Explain two different syntaxes to synchronize code which require exclusive access by threads. [4]

Q.4(c)   Write a program using threads to find the largest element in a two-dimensional array of integers. [6]

Q.5(a)   Enumerate the classes which can be used to read and write objects directly to secondary storage devices. [2]

Q.5(b)   How would you read a random access file in JAVA? [4]

Q.5(c)   Assume the existence of a file that contains a list of integers each of which are separated by a single blank space. Write a program in JAVA to read the file and print the mean, min and max values to another file. [6]

Q.6(a)   Why do applets not require a main method to be launched. [2]

Q.6(b)   What are the various stages in the life cycle of an applet. [4]

Q.6(c)   Write an applet that is passed a string as a parameter from the corresponding HTML page. The applet should display the string when a button is clicked on the applet [6]

Q.7(a)   Why is it not possible for user code to call the paint method? [2]

Q.7(b)   What are adapter classes? Describe with some examples. [4]

Q.7(c)   Write a GUI program using Swing that contains two listboxes and two buttons. The first list box contains the names of 5 different colours of your choice. The second listbox is initially empty. Write anonymous class based event handlers for the buttons such that clicking the first button moves selected elements in the first listbox to the second listbox, while clicking the second button should move all the elements from the first listbox to the second listbox. Moved elements should not be visible in the first listbox. [6]

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$T(N)$: $T\left(\frac{N}{2}\right) + T\left(\frac{N}{2}\right)$

$= 2T\left(\frac{N}{2}\right)$ $a=1, b=2$, $k=0, p=0$
$a > b^k$ $O(n^{\log_b a})$