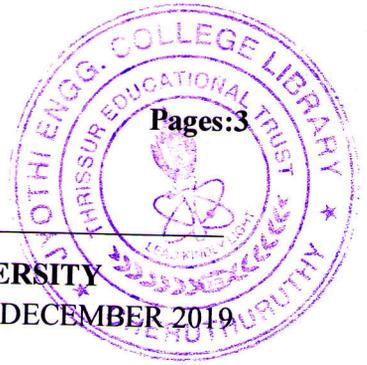D

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019
Course Code: CS206
Course Name: OBJECT ORIENTED DESIGN AND PROGRAMMING

Max. Marks: 100

Duration: 3 Hours

PART A
Answer all questions, each carries 3 marks.

Marks

1 Distinguish between structural and behavioural UML diagrams. (3)

2 Illustrate how information hiding is achieved in Java. (3)

3 Define Testing. What are the major differences between Verification and Validation (3)
Testing?

4 With a simple example, explain the argument passing mechanism used in Java to (3)
pass an instance of a class as argument to a method.

PART B
Answer any two full questions, each carries 9 marks.

5 a) What are the notations used to represent a public, private, protected and package (3)
scope members in a class diagram?

b) What is the syntax for representing a method and a data member in a class diagram? (2)

c) Model a Java class in such a manner that it is restricted to have only one instance (4)
throughout the program in which it is used.

6 a) Illustrate the major functionalities of the 'Class Loader' component within the JVM (4)
architecture.

b) Consider a scenario where a class 'Rectangle' with two data members 'Length', (5)
'Breadth' has to be defined and initialized. Sometimes there would be a need that
the instance initialization should happen by copying the value from an already
initialized instance to the new instance. Model such a class with appropriate
constructors and illustrate the working of the class.

7 a) Why is that, in Java the size of 'char' datatype is of 2 bytes while that in C is of 1 (1)
byte?

b) Illustrate the different steps in the design phase of the Object Oriented Software (3)
Development Process.

c) Write a Java program with a class 'Complex' to represent complex numbers. Model (5)
the class in such a way that it uses constructor overloading aspects to initialize its

instances. Support the design with codes to demonstrate its working.

PART C
Answer all questions, each carries 3 marks.

8　　State the benefits that can be achieved through the use of packages in Java.　　(3)

9　　What is file? How files are represented in Java?　　(3)

10　　Illustrate with an example, how a class in Java can be prevented from getting inherited?　　(3)

11　　Write two subclasses for the 'InputStream' and 'OutputStream' classes in Java and specify its uses.　　(3)

PART D
Answer any two full questions, each carries 9 marks.

12　a)　Can a class in Java implement more than one interfaces, if yes what is the syntax used?　　(1)

　　b)　Consider a scenario where there are two classes: 'BaseClass' and 'DerivedClass', such that 'DerivedClass' is inherited from 'BaseClass'. A function 'public void myFunction()' is defined in both classes. State just the code sequences that would lead to a method overriding scenario and why this scenario is known as run time polymorphism?　　(2)

　　c)　Write a Java program to create a new file named 'MyFile.txt' and write the statement "*This is the University Exam for OODP. This a program to illustrate the use of files.*" into the file with each sentence in the statement representing a new line in the file.　　(6)

13　a)　With a suitable example summarize how 0 to 100% abstraction can be achieved through the use of Abstract class in Java?　　(3)

　　b)　What is Thread Synchronization? With an example illustrate the working of any one technique used for Thread synchronization in Java.　　(6)

14　a)　Define two user defined exception 'EvenNumberException' and 'OddNumberException'. Write a Java class which has a method which checks whether a given number if even or not. The method throws 'EvenNumberException' or 'OddNumberException' if the number is even or odd respectively. Illustrate the handling of the exception with suitable sequence of codes.　　(7)

　　b)　Illustrate the use of the byte stream classes 'DataInputStream' and　　(2)

'DataOutputStream'.

PART E

Answer any four full questions, each carries 10 marks.

15   a)   Define Applet. Draw the life cycle of Applet in Java showing the different methods invoked.   (5)

     b)   Write a Java Applet based program which shows a label and a textbox on the html page. The label and the textbox should display some values which is provided to it from the html code representing the page.   (5)

16   Write Java AWT/Swing based program to display a GUI to accept username and password from user. The GUI should contain the required UI elements and should have appropriate event handling aspects.   (10)

17   a)   Define Events in Java. Illustrate the events and the corresponding event listeners for the UI elements such as TextField, Button and Window.   (4)

     b)   State the advantages of using Adapter Classes (WindowAdapter, MouseAdapter …) instead of the listener interfaces (WindowListener, MouseListener …) for event handling in Java.   (2)

     c)   Write a simple GUI Java program which displays only a Window or a Frame. Provide the implementation of the event handling mechanism such that the Window or Frame is closed when the 'Close (X)' symbol on its top is clicked.   (4)

18   a)   With a diagram explain the overall architecture of the JDBC aspect in Java.   (5)

     b)   Illustrate the role of JDBC driver in the database handling process. What are the different types of JDBC driver available?   (5)

19   a)   What are the basic procedures that have to be followed to communicate with a database in Java using JDBC?   (5)

     b)   With an example, state the basic differences between the execution of the methods 'executeQuery' and 'executeUpdate'.   (5)

20   Write a Java program to store the marks of students corresponding to three subjects in database. The program should provide provision for the following.   (10)

       i.   Create a table in database corresponding to a particular class.

       ii.   Find student who topped the class.

      iii.   Find the average class marks for a given subject.