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Elements of Java Programming
Chapter-1 (1Q) - 8 marks

1) Define java. List the advantages of java programming language.

Imp 2) Define java as Platform Independent Programming Language

3) What are the most powerful features of java? Why Java is popular than C/C++.

Imp 4) Describe how java is a platform neutral language by a diagram. What are the wrapper classes. Explain.

5) How java is more secure than other programming language? Explain.

6) Justify the statement, "Java is designed for distributed application." Explain the different types of Java variables.

Imp 7) How does Java support re-usability? Provide examples.

8) Is JVM machine independent? Explain the use of JVM. How JVM makes Java machine independent.

9) What do you mean by Java System Overview. Explain why Java program are known as portable and architecture neutra

10) Explain with example: Static block, static variable & static method. Why main method is always static & public in Java?

11) WAP to print "Hello Nepal" in console.

12) WAP to generate following triangle using for loop.

```
1
0 1
1 0 1
0 1 0 1
```

13) WAP to show the usages of various data types in java.

~~14) Mention the scope of all modifiers with example (private, default, protected & pub~~

~~15) Discuss about instance variable hiding in Java with example code.~~

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OOP in Java

Chapter - 2 (2Q) - 15 marks

1) Explain the uses of super and this keyword with example.
2) What are the uses of super, finalize and this keyword?
3) In what condition is the use of "this" operator mandatory? Explain with example.
4) Discuss about instance variable hiding in Java with code eg.
5) Mention the scope of all modifiers with example code. (private, default, protected and public)
6) Explain the following terms with suitable program.
   i. Access Protection Mechanism
   ii. Inner Classes
7) Explain multiple inheritance. Why is multiple inheritance not supported in Java. Provide a code example to support your answer.
8) How is it possible to achieve multiple inheritance in java?
9) Explain how a package is created and accessed while developing an application in Java.
10) What is method overloading? Can you override a private or static method in Java? Example.
11) What is constructor. Explain with example.
12) Define polymorphism. How should we implement polymorphis in Java. Example.

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13) Define interface. What are the uses of interface? Explain how it is implemented in Java.
14) Uses of abstract keyword? Explain with example.
15) How does interface differ from abstract class? Elaborate using code snippet.
16) Explain the use of interface to achieve multiple inheritances.
17) User defined package. Process of defining & using it. With example.

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Q) Assignment Vs Initialization

18) Diff: Package & Interface with example.

19) Diff: Interface & Class with example.

20) What is Reflection? Why do we need it? Why is it powerful aspect in java? WAP to demonstrate your answers.

21) Create a class MyClass in a package MyPack. Import newly created class MyClass from Tpm Class.

22) WAP which has two classes A and B, where A should act as Parent class & B should inherit from it. Define Inheritance.

23) WAP that makes an array of integers an argument & returns sum of even numbers in that array.

24) WAP to write "Test on File Handling" inside a file "abc.

25) WAP to demonstrate runtime polymorphism via meth overriding. Write the following classes. Animal as a base class, cat (derived class of Animal). Write a method eat() in Animal class and override that method in the derived classes.

26) Implement an abstract class named Person and two subclasses named Student and Employee in Java. A person has a name, address, phone number and e-mail address. A student has a class status (freshman, sophomore, junior or senior). Define the status as a constant. An employee has an office, salary and date-hired. Implement the above classes in Java. Provide Constructors for classes to initialize private variables. Override the to String method in each class to display the class name and the person's name. Write an application to create objects of type Student and Employee and print the person's name and the class name of the objects.

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27) Make a class Human with a name and age. Make a class Employee inherit from Human. Add instance variable salary of type double. Supply a method showData() that prints the Employee's name, age, and salary. Make a class Manager inherit from Employee. Supply appropriate showData() methods for all classes. Provide a test program that tests these classes and methods.

28) Create a class Employee with id, name, post and salary. Create a parametrized constructor to initialize the instance variables. Override the toString() method to display the employee details.

Short Questions

1. Dynamic Dispatching
2. Casting abstract class
3. Runtime Polymorphism in Java.
4. Inheritance
5. Inner class / Interface
6. Reflections / Reflection API

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Chapter-3 - (10) (7 marks)
Exception, Stream and I/O

1. Explain the user defined Exceptions with suitable java code
2. Exception Handling. Why is it important. What are its usage. Define with example.
3. What are exceptions. How can you create your own exception in Java. Explain with program.
4. Diff btwn :- i) Exception Handling & Error Handling (with program) ii) Checked & Unchecked Exceptions
5. WAP to handle Arithmetic Exception.
6. WAP to input an integer from keyboard and print it on the console. Fire an exception if the input is other than integer using try and catch blocks.
7. List stream classes. WAP using any stream class for writing text to a file.
8. Why do we need to serialize an object? WAP to read numbers from the console using the Input Stream. Also, apply the method of object serialization in your program.
9. WAP to write "Hello World" in a file abc.txt.
10. WAP to read content from file "abc.txt" and store it in "xyz.txt"
11. WAP to store object of a class student into a file "student.dat" also read the objects from same file and display the state of objects on the screen. Handle possible exceptions.
12. A data file "emp.txt" contains name, address and salary of 30 employees. WAP to display only those records who are from "Kathmandu".

SQ) ① Differentiate event handling mechanisms.
~~② Events & Event classes.~~

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Chapter-4 - (1Q) - 7 marks

Applets and Applications

Imp

III 1) Define Applet. Life cycle of an applet. (

2) Discuss the tags used in applet. (Applet Architecture).

3) Write an applet with the functionalities to play, stop & repeat the audio. (The name of audio file is supplied from HTML tag.

4) How can a HTML file pass data to an applet? Explain with code

5) WAAP to illustrate the message sharing btwn HTML & applets.

6) Explain how to display a picture in an applet.

7) What does security restriction means in applets? List out the attributes of applet tag and explain them.

8) Discuss about the Sandbox security model with regard to Java Applet.

9) How is applet diff from normal java program? Write down the steps for converting java application to java applet.

II 10) How can you convert applet to application? Example code.

I 11) WAAP with three text fields with the following names. "number 1", "number 2" and "result". When the user clicks a "sum" button then the sum of the two number in "number 1" and "number 2" should be displayed in the textfield named "result".

SQ

1) Life cycle of Applet

2) Repaint method.

12) Explain about FileReader and BufferedWriter class. How do you create own exception subclasses? Give code example.

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Chapter-5 -(2Q) -15 marks

Events, Handling Events and AWT/Swing

1 1) Event. Types of events. Models available for event handling
2) How event is handled in Java? (3 marks)
3) Diff btwn:- AWT & Swing Package.
4) WAP to create a closable frame in the front and centre of your desktop.
4) Diff btwn:- (i) Frame & Swing
(ii) Panel & Frame
5) WAP to create (iii) a frame in swing. The frame should contain three text fields with labels arg1, arg2 and result respectively, a menu called file with sub menus add, subtract and close.
6) What is a frame? Create a frame with following attributes. Height = 400
Width = 400
Title = My frame
1 7) WAP to create a swing application with 3 buttons representing your favourite colors. When a button is clicked, the background color must change to the corresponding color.
11 8) WAP using frame which contains (i) 3 text fields and one button (ii) accept 2 numbers (iii) when user clicks the button, it should calculate the sum of two number entered in two textfield and display the result in third Textfield.
Imp 9) What do you mean by Border Layout? Give example program
111 10) Diff btwn:- (i) Gridbag Layout & Grid Layout
11) WAP to show the use of Border Layout.

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12) What is layout manager? State the diff types of layout manager in swing. WAP to generate the following output using BorLayout.

	NORTH	
WEST	CENTRE	EAST
	SOUTH	

13) Define dialogue box? Explain it's types? WAP to create your own dialogue box.

14) Write a simple GUI addition application that used two input dialogs to obtain integers from the user and a message dialog to display the sum. (Q8)

SQ)

1) Layout management
2) Frame Layout
3) Dialog Box
4) Events & Event classes

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Chapter-6 (2Q) - 12 marks

Graphics and Images/Animation/Multimedia

1) What is GUI programming? WAP to draw Nepali flag using graphics.
2) WAP to draw a 2D rectangle in green color. Next draw the flag of Nepal inside the rectangle. Write a string "My Nepal" below the rectangle.
3) WAP to display the flag of Nepal, drawing a graph along with the reasonable co-ordinates.
4) Demonstrate various drawing methods. How do you create, load and display image?
5) WAP to change the font of the text in textfield of the frame. The frame contains 3 check boxes named bold, italic and plain.
6) WAP to display "Pokhara University" inside an ellipse. Note that the string should be in serif font and with size 20 and style bold.
7) Create a swing GUI that contains a text field and a button. When the button is pressed the content in the text field should be changed into uppercase and background color of text field should be changed.
8) Create a swing GUI that contains a button and two text fields, when the button is clicked the value of first text field should be checked and display "odd number" or "even number" in text field.
9) Create a graphics application to display "Pokhara University" in blue color with font name: Times New Roman, type: Bold and size: 20. Also, write HTML to embed the applet.

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10) Create a swing GUI which contains a text field (to input radius of circle), a label and a button. When the button is clicked area of circle should be calculated and displayed in the label.

11) Create a frame with one button and one textfield, when user clicks on the button the text entered on textfield should be changed to uppercase.

12) How can you create closable frames in swing and AWT? WAP to draw a bar chart.

13) Create a swing GUI that contains a two buttons (add & subtract) and three text fields. When the buttons are clicked sum or difference of values of first two text fields should be displayed in the third text field respectively.

14) WAP to draw a Bar Chart of Number of Students giving exam for Java, C and C++.

15) WAP to draw a Bar Chart of the total number of students appearing exam in Java. Also, provide Bar Chart for number of male & female students. Hint: Each Bar can be drawn using drawRect(), fillRect() method

16) What are heavyweight components in Java? Are there any alternatives to those heavyweight components? Provide a comparative illustration.

SQ)

1) Graphics Object

12) Closable frames / Closable JFrame

Handling files

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Chapter-7 (10) - 7 marks
Network Programming

1) Uses of URL and URL connection classes. Example.
2) Diff b/w:- URL and URL connection class. Example-
3) What is an URL. WAP for reading contents in a given URL.
4) WAP using the URL class to show URL processing in Java
5) What is Java URL processing? Demonstrate URL connection class method with suitable example program-
6) Define socket programming & its usage in java with eg.
7) What is a socket? WAP to find local IP address & Hostname of the system.
8) Write the steps to create a client Server Program. Provide code snippet for each steps.
9) Create a TCP client/server program in which client & server communicate by sending a message to each other
10) Create a TCP client application that takes input from user and sends it to the server.
11) Create a TCP client/server program in which client sends an integer to the server and the server responds to client by sending square of the number sent by client
12) WAP to send "Message from Pokhara University" from client to server using java socket programming
13) Draw a diagram illustrating how client server interaction occurs in UNIX based system, with detailed methods in each step.
14) What are some key classes defined in java to work with datagrams? How do you get a list of IP addresses ~~with~~ that are assigned to a network interface?
15) Diff b/w TCP and UDP sockets. Explain InetAddress class. Explain network programming.

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16) Diff btwn TCP/IP Programming & datagram programming? Briefly explain the classes and methods that are used to create a TCP/IP Server application.

17) Discuss the process of creation of server and client sockets with Exceptions handled explicitly with a suitable example.

18) Write a client program which connects with server running at port 5000. and send "I am client" message to server and also print received message from server in console. (Assume TCP/IP communication)

SQ

1) URL

2) Socket Programming in Java

19) Diff btwn :- Datagrams & Stream Communication

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Chapter-8 - 2Q (15 marks)
Java Database Connectivity (JDBC)

1) Why JDBC is required in java. Explain the role of JDBC driver.
2) What are the different types of JDBC statements available? Explain with example.
3) Explain different types of JDBC drivers. Draw a JDBC architecture. Define JDBC and ODBC
4) Discuss about the different types of database driver
5) ~~What do you~~ Write short notes about
   i. JDBC-ODBC Bridge & Describe JDBC-ODBC type of bridge & driver in java.
   ii. Java Native Driver
6) WAP to update data on following table.
   Table: Student
   Column:
   NAME TYPE
   id number
   name varchar
   age number
7) Write the steps to insert data in following table.
   Table name: Student

Column	Datatype
Id	number
~~Roll~~ Name	~~number~~ varchar
Roll	number

8) WAP to ~~create~~ connect to a database using JDBC. Assume that database name is test Db and it has table named employee with 2 records.

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9) What are the steps involved for making a connection with a database. WAP to extract & display the information in console from ABC table of Ms-access with suitable values. The ABC table ~~of Ms-access~~ has AAA and BBB fields.

10) WAP to connect ms access database and insert data in the table named "student" which have four fields named "id", "name" "address", "DOB", and "class".

11) WAP to display all records from the database table. Assume the name of database and table yourself.

12) A database "testdb" contains a table "employee" with some records having id, name, post, salary. WAP to update the salary to 5000 whose post is "Manager."

13) WAP to display only those records whose salary is more than 25000 from a table that contains id, name, post, & salary of some employees.

14) Diff btwn:- Simple Statements & Prepared Statements. Also use examples.

15) What is ResultSetMetadata. Give example code.

SQ)

1) JDBC Driver Types
2) JDBC API
3) Executing SQL queries from Java
4) ResultSet.

Chapter 1- SQ

1) Data Types
2) History of Java
3) C++ Vs Java
4) JVM
5) JRE
6) JIT Compile

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