Advanced Java Programming Complete Lab Assessment

Unit - 1:

1. An array is called balanced if its even numbered elements (a[0], a[2], etc.) are even and its odd numbered elements (a[1], a[3], etc.) are odd. Write a function named balanced that accepts an array of integers which returns 1 if the array is balanced and returns 0 otherwise. [2075]
2. Write an object oriented program to find area and perimeter of rectangle. [2073, 2074]
3. Write a program to input and add two numbers using static methods (procedural programming).
4. Write a program to input principle, time and rate, then calculate simple interest using static methods
5. Write both procedural and object oriented programs to calculate the area of a
   a) Circle
   b) Square
   c) Rectangle
   d) Sphere
6. Write a static method to calculate the sum of a one dimensional array
7. Write a program to demonstrate encapsulation.
8. Write a program to demonstrate inheritance.
9. Write a program to demonstrate polymorphism using interface as parent.
10. Write a program to create two classes Circle and Square, with appropriate fields and methods, in a package name shape. Create a separate class ShapeDemo to test the classes.
11. Write a program to demonstrate try-catch-finally.
12. Write a program to create two threads. The first thread should print numbers from 1 to 10 at intervals of 0.5 second and the second thread should print numbers from 11 to 20 at the interval of 1 second
13. Write a program to execute multiple threads in priority base. [2075]

14. Write the simple java program that reads data from one file and writes data to another file. [2070, 2071, 2073, 2074]
15. Write a program to duplicate each character in a text file and write the output in a separate file using character stream.
16. Write a program to read records from a text file which contains people's name, principle, rate and time values. Calculate simple interest and write all the contents of the source file along with simple interest to destination file
17. Write a program to read the contents of a file one line at a time and output them to the screen.
18. Write a program to input whole lines from the keyboard and write them to a file. Exit the program when the user types "quit".

Unit - 2 and 3:

1. Write a program using components to add two numbers. Use text fields. For inputs and output. Your program should display the result when the user presses a button. [2069]
2. Write a program using swing components to multiply two numbers. Use text fields for inputs and output. Your program should display the result when the user presses a button. [2070]
3. Write a program using swing components to find simple interest. Use text fields for inputs and output. Your program should display the result when the user presses a button. [2071, 2074]
4. Design a GUI form using a swing with a text field, a text label for displaying the input message "Input any string", and three buttons with captions "Check Palindrome", "Reverse", "Find Vowels". Write a complete program for the above scenario and for checking palindromes in the first button, reverse it after clicking the second button and extract the vowels from it after clicking the third button. [2075]
5. Write a program to illustrate the use of BorderLayout. [2073]
6. Write a program to calculate simple interest using
   a) GridLayout
   b) GridBagLayout

7. Create a login form with username and password fields. Print “access granted” if the username and password both are “admin”, when user clicks on Login button. If authentication fails, print “access denied”.
8. Create a basic notepad app with the following features:

   a) New

   b) Open

   c) Save

   d) Exit

   Use JButton components to implement these features.
9. Create a form using JFrame to collect the records of students in Bhaktapur Multiple Campus. Each record should contain the following information:

   a) First Name (JTextField)

   b) Last Name (JTextField)

   c) Age (JTextField)

   d) Gender (JRadioButton)

   e) Faculty (JComboBox/JList)

   f) Semester (JComboBox/JList)

   g) Remarks (JTextArea)

   Add both menus and toolbars to save the form to a file (display a save dialog). Also add menu/toolbar items to reset the form as well as exit the program. Remember to close the file on exit command.

Unit - 4:

1. Write a Java program using JDBC to extract the name of those students who live in Kathmandu district, assuming that the student table has four attributes (ID, name, district, and age). [2072]
2. Implement CRUD operations for the student table in Swing. Ask for user input where applicable

Unit - 5:

1. Write client and server programs in which a server program accepts a radius of a circle from the client program, computes the area, sends the computed area to the client program, and displays it by client program. [2075]
2. Write client and server programs in which a server program accepts the length and breadth of a rectangle from the client program, computes the area, sends the computed area to the client program, and displays it by client program.
3. Write an echo server and echo client program using UDP.

Unit - 6:

1. Create a line, rectangle, circle and ellipse using JavaFx
2. Create a different UI using:

   a. Label, TextField,

   b. Button,

   c. RadioButton,

   d. CheckBox,

   e. Hyperlink,

   f. Menu,

   g. Tooltip,

   h. FileChooser

Unit - 7:

1. Write a simple JSP program to display “Kathmandu, Nepal” 10 times. [2069]
2. Write a simple JSP program to display “Lalitpur, Nepal” 10 times. [2070]
3. Write a simple JSP program to display “Tribhuvan University” 10 times. [2071, 2074]
4. Write a program to create a JSP web form to take input of a student and submit it to second JSP file which may simply print the values of form submission. [2075]
5. Write a servlet program to display “Bhaktapur, Nepal” 10 times
6. Write a servlet program to process a login form and authenticate the user. You can use hardcoded values for username and password