Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V • EXAMINATION – SUMMER 2013

Subject Code: 150704 **Date: 20-05-2013**

Subject Name: Object Oriented Programming with Java

Time: 10.30 am - 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** List OOP characteristics and describe inheritance with examples. **07**

(b) Explain & illustrate by examples use of final, finally and method finalize. **07**

Q.2 **(a)** Declare a class called coordinate to represent 3 dimensional Cartesian coordinates(x, y and z). Define following methods: **07**

- constructor
- display, to print values of members
- add_coordinates, to add three such coordinate objects to produce a resultant coordinate object. Generate and handle exception if x, y and z coordinates of the result are zero.
- main, to show use of above methods.

(b) Explain short circuited operators, shift operators and this reference. **07**

OR

(b) Explain packages, their use, adapter classes and their needs & applications. Give examples. **07**

Q.3 **(a)** Declare a class called book having author_name as private data member. Extend book class to have two sub classes called book_publication & paper_publication. **07**

Each of these classes have private member called title. Write a complete program to show usage of dynamic method dispatch (dynamic polymorphism) to display book or paper publications of given author. Use command line arguments for inputting data.

(b) (i) Explain super, instanceof and volatile. **07**

(ii) Compare byte streams and character streams.

OR

Q.3 **(a)** It is required to compute SPI (semester performance index) of n students of your college for their registered subjects in a semester. Declare a class called student having following data members: **07**

id_no , no_of_subjects_registered, subject_code , subject_credits, grade_obtained and spi.

- Define constructor and calculate_spi methods.
- Define main to instantiate an array for objects of class student to process data of n students to be given as command line arguments.

(b) (i) JVM is platform dependent. Justify. **07**

(ii) There is no destructor in Java. Justify.

Q.4 **(a)** Write a complete GUI based program to implement a queue of strings in an applet. Select components and layout of your choice. **07**

Q.4 **(b)** (i) Illustrate by example ï generic programming. **07**

(ii) Explain interface and its usage.

OR

Q.4 **(a)** Write a complete program to have a GUI based simple calculator in a frame supporting addition & subtraction. There are buttons for 0 to 9 digits and for arithmetic operations. Select layout of your choice. **07**

(b) Explain **07**

(i) card layout

(ii) utility class Hashtable with example.

Q.5 **(a)** Write a complete multi-threaded program to meet following requirements: **07**

- Two threads of same type are to be instantiated in the method main.
- Each thread acts as a producer as well as a consumer.
- A shared buffer can store only one integer information along with the source & destination of the information at a time.
- The information produced is to be consumed by appropriate consumer.
- Both producers produce information for both consumers.
- Each thread produces 5 information.

(b) Explain life cycle of an applet. Also illustrate how to provide parameters to applet through html. **07**

OR

Q.5 **(a)** It is required to add two MxN sized matrices having integer elements to produce a third resultant matrix of size MxN. **07**

Write a complete multi-threaded program to meet following requirements:

- Accept all required arguments from the command line.
- Instantiate M threads ï with id 0 to M -1 respectively, each thread performing addition of elements on the row specified by its id to produce corresponding row of the resultant matrix.

(b) Explain wait, notify, synchronized and native methods. **07**

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