**Core Java**

**Employee Id: \_\_\_\_\_\_\_\_\_\_\_\_\_ Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Duration: 3 Hours                                                                      Marks: 25**

**Instructions:**

1. ***First 10 minutes are provided to read & understand the test paper.***

***Last 10 minutes are provided to properly submit the test answer folder.***

***These 20 minutes are not counted in test duration***.

1. Create a workspace on the desktop. Create a java project with GID as name. Save all your files in this project only. Upload your Project folder and SHIFT + DEL from desktop.
2. Return the test paper to invigilator at the end of the test.
3. Referring Java Documentation is allowed.
4. Write your employee id in top left corner of the test paper
5. Use of Eclipse editor is allowed.
6. **Read all the section of paper carefully.**
7. **Marks will be only awarded to working functionalities.**
8. **Switch OFF your Cell Phone.**

**Q. 1 [Marks: 15]**

Aditya Birla Hospital is one of the big hospitals which provide medical services to different patients. This hospital has different doctors of various specialties. Design an application for appointments of different doctors as per following guidelines.

Create a class **Appointment** with following members-

private Date appDate

private int noOfPatients

Setter and getter methods for both these instance variables.

In the setter method of noOfPatients, perform following validations:

* no of patients must be between 1 to 15

If validation fails, raise an exception **InvalidDataException**.

Create class **Doctor** with following members:-

private String docId

private String docName

private ArrayList apptList - An arraylist of type Appointment

public void addAppointment(Appointment)

public void printAppointment()

Setter and getter methods for all instance variables.

Design a class **TestClinic** having main method to perform following functionality.

1. Create an array of type Doctor of size 2 and accept data from user for 2 doctors
2. Add 2 appointments for each Doctor into the array list
3. Accept doctor id from user and print all appointments of that doctor. If doctor id does not exist then print message **“Doctor ID does not exists”.**

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| **Q 1** | **Functionality** | **Marks** |
| a) | Designing Appointment class properly | 3 |
| b) | Designing Doctor class properly | 3 |
| c) | Performing validations and handling exceptions | 2 |
| d) | Creating Doctor and Appointment objects | 2 |
| e) | Accepting Doctor id and validating | 3 |
| f) | Printing the appointment details for the given Doctor id | 2 |

**Q 2 [ Marks – 10 ]**

Write a Java Application to demonstrate multi-threading by implementing Runnable interface.

Create 3 threads with names SlowThread, MediumThread and FastThread with low, medium and high priorities respectively.

Each thread has to be assigned with the task of printing the multiplication table of a specified value.

Start the child threads from the main thread.

The main thread has to wait for the completion of the Child thread

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| **Q 1 - B** | **Functionality** | **Marks** |
| a) | Implementing Runnable interface | 2 |
| b) | Creating threads with different names and priorities | 2 |
| c) | Printing multiplication tables | 3 |
| d) | Proper termination of the child threads and the main thread | 2 |
| e) | Coding conventions, indentation, comments | 1 |