**Q.1 Attempt any four** [20 marks]

### Case Study : Railway Reservation:

Passenger makes reservation for tickets. Before making the reservation passenger checks for the availability of the ticket. If the seats are available, he books the seat and makes the payment. If the seats are not available, he is put for the waiting state. If required he can cancel the reservation and the cancellation charges are applied.

a) Draw the class diagram for following case study.
b) Write a short note on association, dependencies and composition.
c) Draw Use case diagram for the following case study.
d) What is need of development process of using UML?
e) Give the guidelines for Activity diagram.
f) Draw Sequence diagram for given case study.
g) Explain Inheritance and Generalization.
h) Write a python code considering the case study using the init method.

**Q.2 Attempt any four.** [20 marks]

**A) Case Study : Library Management System:**

Consider a library system. It consists of several books and journals. Books has author and publishers. Students issues and return book and teachers also issues and return book. If student do not return book, he has to pay fine.

**B) Case Study : University Registrar Office:**

University office maintains data about the following entities 1. Courses including number, title, credits and syllabus. 2. Courses Offering including number, year, semester, section number, instructor, timing and classroom. 3. Students including id, name and program. 4. Instructor including id, name, department and title.

a) Draw communication diagram for case study A.
b) Explain various components of communication diagram.
c) Draw Activity diagram for case study A.
d) Write a python code for case study B using multithreading concept.
e) Explain various components of Activity diagram
f) Draw Activity diagram for case study B.
g) Draw Communication diagram for case study B.
h) Write a python code for case study A using init and del method

## Q.3 Attempt any four                                                [20 marks]

### Case Study : Hospital Management.

Consider a hospital database. It consists of two section, OPD and IPD. It contains sets of paitents, medical doctors, nurses and ward boys. It consists of three types of wards viz. general, ICU and private ward. Patient is admitted into a ward. Every patient is admitted into a ward. Every patient undergoes several different tests and treatments are reffered by the doctor. When patient gets discharged from hospital associated information is stored in database. Patient pays bill to hospital.

a)    Draw a State Change Diagram for given case study.
b)    Explain components of state change diagram.
c)    Draw Package diagram considering the case study.
d)    Explain the concept of package diagram with respect to class diagram.
e)    Generate a python code for creation of modules and packages.
f)    Explain the concept of package diagram with respect to usecase diagram.
g)    Define event and explain different types of event.
h)    How to create multiple thread to implement concurrent flow of control, module and packages.

## Q.4 Attempt any three                                                [15 marks]

### Case Study : Order Processing System.

The Simplified Order Processing System is a system designed for managing how customers place an order, doing payments after receiving the invoice and the ordered products, the retailer should also verify the availability of the stock.
A retailer checks for the availability of goods in the store. If the stock of goods is less than the reorder level, the retailer places an order for goods. The supplier supplies the goods to the store in the system. Once the ordered goods are received at the store, the retailer then arrange them by product or by price, then retailer makes payment. If the stock of goods is available then he will arrange goods for sale.
The retailer then sells the goods directly to the customer. The customer buys the items from retailer. The retailer prepares the bill for all the goods purchased by the customer, then he receives amount either by credit or by cash from customer soon after the product is delivered to the customer. We will not consider customer returns the overall system is used to manage the goods in the store and does the sales.
The system should comprise of the following set of classes – products, customer, bank, account, order-details, invoice, shipments, etc.

a)    Give the guidelines for use case modules.
b)    Draw a class diagram for given case study.
c)    Draw activity diagram for following case study.
d)    Draw state change diagram for given case study.
e)    Explain CRC.
f)    Draw Communication diagram for given case study.

—— The End ——