Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FIRST SEMESTER M.TECH. (S/W) DEGREE END SEMESTER EXAMINATION NOV/DEC-2015
SUBJECT: OBJECT ORIENTED ANALYSIS AND DESIGN – ICT 525
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **26/11/2015** **MAX. MARKS: 50**

Instructions to candidates

- Answer any **FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.

1A. Consider a Hospital Management System, ward is a division of a hospital or a suite of rooms shared by patients who need a similar kind of care. In a hospital, there are a number of wards, each of which may be empty or have on it one or more patients. Each ward has a unique name. The doctors in the hospital are organised into teams (also called firms). Each team has a unique name or code (e.g. Orthopaedics or Paediatrics) and is headed by a consultant doctor or an attending physician.

a. List clearly the name of the class pattern along with the class derived by using common class pattern approach.
b. Draw the class diagrams with identified classes.
c. Refine the diagram by attaching attributes, operations, relationships between the classes, multiplicity specifications, and any other model elements that you find appropriate.

[5+3+2]

1B. Consider a customer object (C) associated with three order objects (O1, O2 and O3). These order objects are associated with special order and normal order objects (S1, S2 and N1). The customer is having the following three orders with different numbers (12, 32 and 40) for the particular time considered. Special order and normal order objects which are having number of orders as 20, 30 and 60. Draw a neat Object diagram to model the above scenario.

1C. Differentiate aggregation and composition relationships in class diagram with suitable examples.

[5+3+2]

2A. In an UML diagram, how frameworks and mechanisms are represented? Consider a scenario of an ATM System. A customer can withdraw money from ATM by using his ATM card and PIN. The ATM system will communicate to Bank server to fetch the required details. Bank maintains application server and database as separate devices. For the above scenario, draw a neat deployment diagram by considering all cases.

2B. Model online purchase activity using a component diagram.

2C. How nodes are different from artifacts? Draw their representation in UML.

[5+3+2]

3A. Consider a scenario that you are working in an IT company. A client is approaching you to develop Social Networking Application for his organization. Explain about various phases of Object Oriented Analysis on the basis of above scenario with suitable diagrams.

3B. Describe the advantages of Agile software development process compared to Traditional software development process.

3C. Distinguish Collaboration and Sequence diagrams.

[5+3+2]

4A. Model an UML behavioral state machine diagram showing Bank Automated Teller Machine (ATM) by considering the below scenarios.

- ATM enters '*Self Test*' state once it is turned on.
- If test fails, it goes to *'Out Of Service'*; otherwise *triggerless* transition to '*Idle*' state.
- State change from Idle to '*Serving Customer*' when customer inserts card in atm.
- Action *readCard* is performed on Serving Customer state.
- State changes to *Idle* once customer triggers *Cancel* action.
- *Serving Customer* state is a composite state (substates are *Customer Authentication*, *Selecting Transaction* and *Transaction*).
- State changes to *Idle* once transaction is completed.
- It has an exit action '*ejectCard*'.

4B. Consider a use case "Withdraw Money" from an ATM machine. Identify the following as part of use case template.

a. Pre-condition and Triggers

b. Primary and Secondary actor

c. Two alternate scenarios

4C. Draw a neat collaboration diagram for "Online Bookshop".

[5+3+2]

5A. Draw a sequence diagram for a railway reservation system by considering loop, alt, opt, blocks.

5B. Consider a Ticket Vending Machine where activity is started by Commuter actor who needs to buy a ticket. Ticket vending machine will request trip information from Commuter. Based on the info machine will calculate payment due and request payment options. After payment is complete, ticket is dispensed to the Commuter. Draw UML Activity diagram.

5C.Explain with a suitable example, the expansion regions in activity diagram.

[5+3+2]

6A. What are the Corollaries used for good object oriented design? Explain any five with justification.

6B. How Access Modifiers are represented in UML diagrams? Explain each with a scenario to justify its use.

6C. What are composite structure diagram and reflexive association in class diagrams?

[5+3+2]