



MANIPAL

*A Constituent Institution of Manipal University*

**END SEMESTER EXAMINATIONS, NOV/DEC 2016**

SUBJECT: SOFTWARE DESIGN [ICT 5123]

**REVISED CREDIT SYSTEM**  
**(29/11/2016)**

Time: 3 Hours

MAX. MARKS: 50

**Instructions to Candidates:**

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

- 1A. Explain and compare the following process models.  
i) Incremental ii) Spiral
- 1B. With a neat diagram explain SCRUM agile process model.
- 1C. "Software does not wear out". Justify this Statement.
- 2A. Explain the following software design concepts emphasizing their use and need with relevant example.  
i) Coupling and Cohesion  
ii) Abstraction and Information Hiding  
iii) Refactoring  
iv) Software Refinement
- 2B. Develop a complete Use-case specification for searching books on specified topic in an online store.
- 2C. Describe the elements of requirements model.
- 3A. Identify the classes with the noun phrase approach and draw the class diagram with all relationships and appropriate multiplicities for following problem statement.  
The Best School of Business keeps track of each graduate's student number, name, country of birth, current country of citizenship, current name, current address, and the name of each major the student completed (each student has one or two majors). To maintain strong ties to its alumni, the school holds various events around the world. Events have title, date, location, and type (e.g., reception, dinner or seminar). The school needs to keep track of which graduates have attended which events. When a graduate attends an event, a comment is recorded about the information school officials learned from that graduate at that event. The school also keeps in contact with graduates by mail, e-mail, telephone and fax interactions. As with events, the school records information learned from the graduate from each of these contacts. When a school official knows that they will be meeting or talking to a graduate, a report is produced showing the latest information about that graduate and the

- information learned during the past two years from that graduate from all contacts and events the graduate attended. 5
- 3B. Draw the use-case diagram for Hotel Information System. There are two types of customers: Tour-group customers and Individual customers. Both can book, cancel, check-in and check-out of a room by Phone or via the Internet. There are booking process clerk and reception staff who manage it. A customer can pay his bill by credit card or pay utility bill. 3
- 3C. Explain the various relationships with respect to the use case diagram drawn. 2
- 4A. Explain the quality attributes to be considered during software design. 2
- 4A. Define the purpose of following terms with suitable example and UML notations. 5
- i. Composition
  - ii. Use Case Generalization
  - iii. Activity
  - iv. Association
  - v. Synchronous Message
- 4B. With a suitable example explain a sequence and collaboration diagram. 3
- 4C. What are association classes ? Give an example. 2
- 5A. With an example explain any two structural design patterns. 5
- 5B. Draw the swim-lane diagram for the following problem statement. 3
- The client and server are the two modules, where server will produce the services requested by the client. Initially the server will be in the listen mode. Being in the listen mode the server may get a client's IP address. The server validates the IP address sent by the client. The server will be in the accepted stage and wait for the file-name which wants to be downloaded. On receiving a file-name server starts downloading. The size of the file is 50 Mbs. Due to some technical problem the server may be down after successful download of 30 Mbs so that downloading of a file will be stopped else download will continue till the end of file. On server recovery, due to the installed download manager software the downloading of a file will start from the broken or paused downloads and continues till the end of file.
- 5C. Draw a detailed state machine diagram for the scenario given in the Q.5B, by properly specifying its event, action and guard, pertaining to 2
- i) Client module
  - ii) Server module