Birla Institute of Technology & Science, Pilani
Work-Integrated Learning Programmes Division
First Semester 2015-2016

Mid-Semester Test
(EC-2 Regular)

Course No.   : SS ZG514
Course Title   : OBJECT ORIENTED ANALYSIS & DESIGN
Nature of Exam   : Closed Book
Weightage   : 35%
Duration   : 2 Hours
Date of Exam   : 20/09/2015   (FN)

No. of Pages   = 2
No. of Questions = 6

Note:
1. Please follow all the *Instructions to Candidates* given on the cover page of the answer book.
2. All parts of a question should be answered consecutively. Each answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Read the Case Study presented below before you answer the questions that follow:

HiTech Library System

HiTech Pvt. Ltd. is a company developing software for clients in Europe. Hitech has a well stocked library for its employees. Any employee who is employed by the company can issue books. Each employee can issue at most two books. Other reading material is also available in the library; eg. magazines, research papers, video cassettes.

A Systems Analyst who visited the library made the following notes:

Process for issuing a book:

Every book has a barcode sticker pasted on it. Every employee has an I-card on which a barcode sticker is pasted.
Employee selects a book and approaches the librarian. The librarian scans the barcode on the book with a barcode scanner. The employee scans the barcode on his I-card with the barcode scanner. The librarian verifies book details and employee details before finalizing the issue transaction for the book. The librarian informs the return date of the book issued to the employee.

Process to return the book:

Employee carries the book to the librarian who initiates the return transaction. Employee scans the barcode sticker on his I-card and the librarian scans the book with a barcode scanner. System calculates the fine by using fine calculation rules. Librarian asks for the fine amount if any from the employee. Employee pays the fine. Librarian finalizes the return transaction.

Note that, in the above system, if barcode scanner does not work, librarian should be able to enter data using the keyboard. There should be provision of providing rules of fine calculation.
Even if the employee doesn't have a barcode sticker on I-card, librarian should be able to input the employee id manually.

Read the Case Study on the previous page before answering the questions

Q.1 (a)   Explain the four major phases of unified process used in object oriented analysis and design.   [2]

Q.1 (b)   Draw a sketch to show the extent of work during each phase for the following UP disciplines: Business Modeling, Requirements, Design, and Implementation.   [3]

Q.1 (c)   State the Agile Manifesto   [2]

Q.2 (a)   Draw a use case diagram for the library case study. Demonstrate <include> and <extend>   [3]

Q.2 (b)   Write a fully dressed use case in detail for Process for Issuing a Book in the library case study. Demonstrate <include> and <extend>   [5]

Q.3.   Draw a system sequence diagram for Process for Issuing a Book in the library case study.   [5]

Q.4.   Draw a state transition diagram for the library case study shown below. List all the valid states chosen.   [5]

Q.5.   Draw a sequence diagram as well as a communication diagram for Process to Return a Book.   [5]

Q.6.   Draw activity diagrams for both scenario in the library case study.   [5]

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