



School of Information Technology and Engineering

Fall Semester 2022-2023 – Fresher

Continuous Assessment Test – II

Programme Name & Branch: MCA

Course Name & code: ITA5005 Object Oriented Software Engineering

Class Number (s): VL2022230106228, VL2022230106234, VL2022230105116

Slot: F2+TF2

Faculty Name (s): Prof. Sweta Bhattacharya, Prof. Rajiv S and Prof. Asha M

Exam Duration: 90 Min.

Maximum Marks: 50

General instruction(s):

Q.No.	Question	Max Marks
1.	<p>The online shopping portal provides a soothing shopping buying experience for customers. The system allows more than one categories and different brands under the segment to be purchased. A typical purchase scenario would be:</p> <p>A customer visits the online shopping portal. A customer may <u>buy item</u> or just visit the page and <u>logout</u>. The customer can select a segment, then a category, and brand to get the different products in the desired brand. The customer can select the product to <u>purchasing</u>. The process can be repeated for more than one item. Once the customer finishes selecting the product/s the cart can be viewed. If the customer wants to <u>edit</u> the final cart it can be done here.</p> <p>For final payment the customer has to <u>login</u> the portal, if the customer is visiting for the 1st time he must <u>register</u> with the site, else the customer must use the <u>login page</u> to proceed.</p> <p>Final cart is submitted for <u>payment</u> and <u>card details</u> and <u>address</u> (where shipment has to be made) are be <u>confirmed</u> by the <u>customer</u>. Customer is confirmed with a <u>shipment Id</u> and delivery of goods within 15 days</p> <p>Assumptions:</p> <ul style="list-style-type: none">• The currency followed is <u>INR</u> as the site provides for only <u>Indian</u> customer base• There are different <u>segments</u>, <u>categories</u>, <u>brands</u> where a brand can fall under more than one category.• The shipment of the goods is not covered under the scope of the case• Complaints by the customers are not handled by the case study.• Customers have to be <u>validated</u> before the payment can be confirmed.• The actors are <u>Customer</u> and <u>Administrator</u> <p>Considering the above requirement, draw an Activity diagram in detail. (10)</p>	10

2.	Considering the Scenario mentioned in Question 1, Draw a Sequence Diagram. (10)	10
3.	<p>You have been asked to develop a new Course Registration System for your college. The college wants a web-based system to replace its manual system. The college provides education in various streams. In any stream, the entire registration is divided into semesters. The new system should allow the aspirants to submit their application online. Once their applications have been approved and they have been admitted into the college, the system should send an automatic welcome e-mail along with login id and password to the e-mail address of your students. The e-mail address is specified as part of an application. For students without any e-mail address, the system shall print the welcome letters to be posted. The students would also have selected their stream of interest. Each stream will have a set of courses which are mandatory, and a certain number of elective courses. These electives will be applicable from the fifth semester onwards. The student has to select two electives. The complete list of courses is maintained in the database. This database belong to another system and hence cannot be updated or changed by the new system in any manner. The database can only be read by the new system. The beginning of the semester, the head of the department will create necessary class and allocation of lectures to the classes for his department. The HOD may make changes in the allocation during the progress of the course. The system maintains the history of all the professor who has conducted a class throughout the semester. The lecturer will use the system to update the marks of the student (Project, Assignment, Internal Test Marks and the semester and the examination marks). The lecturer will also mark the attendance of the student in the system. The student can view his/her marks and attendance through the system. In addition to the above, the system also keeps track of residential status of the system. The student may be hosteller or a day scholar. If he is a hosteller, the system will maintain his/her hostels' name, room number and the fee pertaining to the same.</p> <p>Considering the above requirement, draw a Data Flow Diagram – Level 0 and Level 1.</p>	10
4.	Considering the Scenario mentioned in Question 3, Draw a State Transition Diagram. (10)	10
5.	Assuming that you are developing Movie Ticket Booking system similar to "BookmyShow". While designing the user interface, as a UI designer, identify the plausible difficulties you might encounter. Also mention the mitigation steps that you would take to ensure the design meets the required quality criteria. (5+5)	10



KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS TREATED AS EXAM MALPRACTICE

Answer ALL Questions

(10 X 10 = 100 Marks)

1. For the scenario described below, which life cycle model would you choose? Give the reason why you would choose this model. Explain the stages involved in the model. List the advantages and disadvantages of the model chosen.

You are interacting with the MIS department of a very large oil company with multiple departments. They have a complex regency system. Migrating the data from this legacy system is not an easy task and would take a considerable time. The oil company is very particular about processes, acceptance criteria and legal contracts.

2. Consider an elevator that has the basic functions such as moving up and down open and close doors and pick up passengers. The elevator is supposed to be used in a building having floors numbered from 1 to n. There are call buttons in the elevator corresponding to each floor. For every floor except floors 1 and n, there are two floor call buttons for the passengers to call elevator for going up and down. There is only one down call button at floor n and one up call button in floor 1. Then the car stops at a floor, the doors are opened and the elevator light indicating the current direction the elevator is going is illuminated so that the passengers can get to know the current moving direction of the elevator. When the elevator is moving a music audio is played inside the elevator.

Draw class diagram for designing this system.

3. A mobile device has to be fitted with an alarm clock. The clock has a display unit to show the time of day. Using buttons, the user can set the hours and minutes field individually. It supports a 24-hour display. It is possible to set one or two alarms. When an alarm fires it will set some noise. The user can turn it off, or choose to "snooze". If the user does not respond at all the alarm will turn off itself after 2 minutes. 'Snoozing' means to turn off the sound, but the alarm will fire again after some minutes of delay. This snoozing time is pre-adjustable. **Identify the functional requirements and non-functional requirements for the clock.**

4. Design a use case model for the scenario discussed in question 3.

5. Model a sequence diagram for the following scenario.

XYZ super market wants a subsystem to process supply orders via the web. The user will supply via a form their name, password, account number and a list of supplies along with an indication of the quantities desired. The subsystem will validate the input, enter the order into a database and generate a receipt with the order number, expected ship date and the total cost of the order. If the validation step fails, the subsystem will generate an error message describing the cause of the failure.

6. Model a state transition diagram for the following scenario. Here is what happens in a micro wave oven:

- The oven is initially in an idle state with door open, when the light is turned on.
- When the door is closed it is now in idle but the light is turned off.
- If a button is pressed, then it moves to initial cooking stage, where the timer is set and lights are on and heating starts.
- At any moment the door may be opened, the cooking is interrupted, the timer is cleared and heating stops.
- Also, while cooking, another button can be pushed and extended cooking state starts, where the timer gets more minutes. At any moment door can be opened here also.
- If the timer times out, then cooking is complete, heating stops, lights are off and it sounds a beep.
- When the door is open, again the oven is in idle state with the door open.

7. a) List out the principles leading to good software design. [4]
b) Discuss on the need for minimizing coupling and maximizing cohesion in the design of software. [6]

8. "Building on the work and experience of others" – Considering this statement, discuss the most commonly used reusable techniques practiced by software engineers during software development.

9. Assuming you are designing a server for the following classes of applications, list the kinds of main activities that you might expect the server to do:

- (a) A server for an airline reservation system.
- (b) Your favorite site for buying books on the Internet.

10. What is the difference and similarity between Agile and Scrum? When and where Agile and scrum are used? Is there any drawback of the Agile model? If yes, explain.

