



THE UNIVERSITY OF THE WEST INDIES

Semester I ☒ Semester II ☐ Supplemental/Summer School ☐

Examinations of December ☒ April/May ☐ July ☐ 2016

Originating Campus: Cave Hill ☐ Mona ☒ St. Augustine ☐

Mode: On Campus ☒ By Distance ☐

Course Code and Title: **COMP2171 – Object Oriented Design and Implementation**

Date : December 5, 2022

Time 4:00 pm

Duration: 2 hours

Paper No:

Materials required:

Answer booklet: Normal ☒ Special ☐ Not required ☐

Calculator: Programmable ☐ Non Programmable ☐
(where applicable)

Multiple Choice answer sheets: numerical ☐ alphabetical ☐ 1-20 ☐ 1-100 ☐

Auxiliary/Other material(s) – Please specify:

Candidates are permitted to bring the following items to their desks:

Instructions to Candidates: This examination paper has 3 pages & 1 question.

DO ALL QUESTIONS ON THIS EXAMINATION PAPER

SEMESTER 1 2022/2023

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Date: 2022/11/23...

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QUESTION 1

A hospital requires a patient management system that facilitates the creation and maintenance of patient records (both in-patient and out-patient) at any point of service in the hospital (e.g. casualty, pharmacy, phlebotomy, x-ray, admissions, etc.). The system should also be used to create and manage the documentation of the details associated with the services rendered when the patient uses any of the service departments. The intent is that only one record will be maintained per patient and accessed across the multiple service points using a unique patient id number. The system must maintain personal information for each patient including things such as name, date of birth, address, allergies, next of kin and details of each instance of a service rendered.

When a patient visits any one of these service departments, a reception personnel will register them by creating a registration record with current information (i.e. weight, blood pressure, temperature and any other relevant registration information). The patient's personal information record is also updated where necessary. If the patient is not already in the system, then the registration process will be preceded by creating a new patient record.

During receipt of the actual service (i.e. being catered to by doctor, pharmacist, phlebotomist etc.) a service record is created and updated with the details of the visit. This service record is of course linked to the patient's registration record and therefore the patient's record. The patient's record therefore holds the personal information, registration for each occurrence of a service being accessed and the details associated with that service.

For enforcement of certain privacy requirements, the system should be accessible only on the specific devices assigned within the various service locations.

- a) Based on the limited information supplied, state TWO (2) assumptions that you would make if you had to start the design today.

[2 marks]

- b) Create a domain model to assist in describing the information you have received.

[10 marks]

- c) Draw a UML use case diagram (*at least 8 use cases – no marks will be awarded for user management or login, logout*) to represent the goals of the users of this system for discussion with your clients.

[8 marks]

- d) For ANY ONE the use case in the use case diagram:

- i. Write a use case specification using the template given in the appendix.

[6 marks]

- ii. Draw a class diagram that illustrates the classes and design decisions supporting the interactions required to realize the use case in section (i). *While you won't be penalised for showing additional details, please note that you are **only** required to show class diagram details that support the interactions required for the use case in part (i).

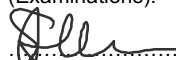
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- iii. Create a sequence diagram that illustrates the interactions required to realize the use case in section (i). The sequence diagram must reflect or be in synch with the class diagram in (ii). [6 marks]

- iv. Create an object diagram that reflects the state of the objects in your system at runtime in a scenario of the use case in part (d). Explain your object diagram. [4 marks]

[4 marks]
[Total 40 marks]

*****End of Exam*****

Appendix:

Template for Use Case Specification:

1. Use Case Name
2. Use Case Rationale
3. Pre Conditions
4. Successful End Condition
5. Failed End Condition
6. Primary Actors
7. Secondary Actors
8. Trigger
9. Main Flow
10. Extensions

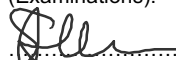
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