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MAIN EXAMINATION

SEPTEMBER - DECEMBER 2023

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

CMT 310: OBJECT ORIENTED ANALYSIS AND DESIGN

DATE: DECEMBER 2023	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

Q1.

a) Explain the basic process of analysis.   **(3 Marks)**

b) Carefully study the following case study of operations at the university library and answer the questions that follow.

The borrowing activities are built around checking books out and returning books by borrowers. There are three types of borrowers: students, faculty or staff, and guests. Regardless of the type of borrower, the borrower must have a valid ID card. If the borrower is a student, having the system check with the registrar's student database validates the ID card. If the borrower is a faculty or staff member, having the system check with the personnel office's employee database validates the ID card. If the borrower is a guest, the ID card is checked against the library's own borrower database. If the ID card is valid, the system must also check to determine whether the borrower has any overdue books or unpaid fines. If the ID card is invalid, the borrower has overdue books, or the borrower has unpaid fines, the system must reject the borrower's request to check out a book, otherwise the borrower's request should be honored.

   i.   Draw a use case diagram to represent the above case.   **(6 Marks)**

   ii.   Draw an activity diagram to represent the above case.   **(7 Marks)**

c) Describe Rapid Application development approach to systems development.

                                                                             (4 Marks)

d) Describe the characteristics of object oriented systems.   **(5 Marks)**

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e) Discuss the factors that are considered in selecting a given systems development methodology. **(5 Marks)**

Q2.

a) Discuss two classes of structured system development methodologies. **(6 Marks)**

b) Discuss the critics of agile development methodologies. **(4 Marks)**

c) Explain the difference between a traditional approach and an object-oriented approach to system development. **(4 Marks)**

d) Distinguish between problem analysis and root cause analysis. **(3 Marks)**

e) Explain the reasons behind the categorization of object oriented methodologies. **(3 Marks)**

Q3.

a) Discuss the purpose of the following and highlight what is involved.

i) Analysis workflow **(3 Marks)**

ii) Environment workflow **(3 Marks)**

ii) Testing workflow **(3 Marks)**

iii) Identify the respective phases of the unified process that i), ii) and ii) are associated with. **(3 Marks)**

b) Describe agile development methodology. **(3 Marks)**

c) Describe the principles of modern object oriented approaches to developing information systems. **(5 Marks)**

Q4.

a) Discuss the activities that are carried out in each of the phases of the systems development life cycle. **(8 Marks)**

b) Discuss the benefits of object oriented systems analysis and design. **(4 Marks)**

c) Discuss the aspects that influence the choice of a requirements gathering technique. **(8 Marks)**

Q5.

a) Explain the purpose of a class diagram. **(3 Marks)**

b) Describe the process of verifying and validating functional models. **(8 Marks)**

c) Using a class diagram syntax, represent the following logical aggregations

i) An instance of the Desk class IsPartOf an instance of the Office class.

(3 Marks)

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ii)   An instance Employee class IsPartOf an instance of at least one instance of the Department class.   **(3 Marks)**

iii)   An instance of the Wheel class IsPartOf an instance of the Vehicle class.

(3 Marks)

END

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