No. of Printed Pages : 3　　　**MCS-219**

MASTER OF COMPUTER APPLICATIONS (MCA)

(New)

Term-End Examination

December, 2021

MCS-219 : OBJECT ORIENTED ANALYSIS AND DESIGN

Time : 3 Hours　　　　　*Maximum Marks : 100*

Note : *Question* ***No. 1*** *is compulsory and carries 40 marks. Attempt any* ***three*** *questions from the rest.*

1. (a) What is object oriented analysis and design ? Explain its advantages. 　10

　(b) What is Association ? What are the different types of association ? Explain with the help of an example of each. 　10

　(c) What is Object Model ? Explain the use of object model in "software system development" with the help of an example.

　　10

　(d) What is activity diagram ? Explain its purpose with the help of an example. 　10

2. (a) What is DFD ? Briefly explain the symbols used in DFD. Draw DFD upto level 1 for "Online Library System". Make necessary assumptions. 　12

　(b) Explain the concepts of abstraction and encapsulation with the help of an example for each. 　8

3. (a) What is use case diagram ? Draw use case diagram for ATM cash withdrawal process.

　　10

　(b) An online library system provides facility for online membership on payment of subscription fee. This system provides facility of access and downloading the books and research articles. Draw class diagram for this system. Make necessary assumptions. 　10

4. (a) Explain mapping of ternary associations to database tables with the help of an example. 10

   (b) Explain dynamic modeling with the help of an example and a suitable diagram. 10

5. Write short notes on the following : 4×5=20

   (a) Object ID and its advantages

   (b) Collaboration diagram

   (c) Design optimization

   (d) Features of a good object design

MASTER OF COMPUTER APPLICATIONS (MCA-NEW)

Term-End Examination

June, 2022

MCS-219 : OBJECT ORIENTED ANALYSIS AND DESIGN

Time : 3 hours *Maximum Marks : 100*

*Note : Question no. **1** is **compulsory** and it carries 40 marks. Attempt any **three** questions from the rest.*

1. (a) What is object orientation ? Explain the principles of object orientation. Also list the advantages of object orientation. *10*

    (b) What is generalization ? How is it different from specialization ? Explain with the help of an example and diagram. *10*

    (c) What is UML ? Explain the advantages of using UML. Draw a use case diagram for book issue and return in a library system. Make necessary assumptions. *10*

(d) What is association ? Explain the advantages of two-way association over one-way association, with the help of an example. *10*

2. (a) What is a class diagram ? Draw a class diagram for "Online Banking System". Make necessary assumptions. *10*

(b) What is DFD ? List the symbols used in DFD. Draw up to level 1 DFD for an "Online Banking System". Make necessary assumptions. *10*

3. (a) What is a dynamic model ? Explain any two UML diagrams used in dynamic modelling. *10*

(b) Explain how classes of a system are mapped to database tables, with the help of a suitable example and diagram. *10*

4. (a) Explain the concept of inheritance and polymorphism in OOAD, with the help of examples. *10*

(b) What is aggregation ? Why is it called a special kind of association ? Explain with the help of an example. *10*

5. Write short notes on the following : *4×5=20*

    (a)   State Diagram

    (b)   Object Design

    (c)   Implementing Association

    (d)   Integrity Constraints

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MCS-219

MASTER OF COMPUTER APPLICATIONS (MCA) (NEW)

Term-End Examination

December, 2022

MCS-219 : OBJECT ORIENTED ANALYSIS AND DESIGN

Time : 3 Hours   *Maximum Marks : 100*

Note **:** *(i) Question **No. 1** is compulsory and carries 40 marks.*

*(ii) Attempt any **three** questions from the rest.*

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1. (a) An online banking facility allows customers to check their balances and perform online transactions for purchase of goods. A customer should have an account with the bank in order to use this facility. Draw a class diagram for this system. Make necessary assumptions.   10

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(b) What is an event ? Explain with the help of an example. Also define the term scenario in this context. What is a state ? How is it related to an event ? Why do you draw a state chart diagram ? Explain the symbols used in state chart diagram with the help of an example diagram.   10

(c) Explain the factors that impact the choice of algorithm in the context of object design. What are the tasks of designer while performing design optimisation ? Explain each task with the help of an example.   10

(d) How can you map object classes to tables ? Explain with the help of an example. Also explain how you map one-to-many association to tables, with the help of an example.   10

2. (a) What are the objectives of use-case diagram ? Draw a use-case diagram for book issue and return system in a library. Make suitable assumptions. How are interaction diagram different for use case diagrams ?   10

(b) What is the purpose of drawing component diagram ? Explain the graphical components that are used to draw a component diagram. Draw and explain component diagram of ATM system. Make suitable assumptions.   10

3. (a) Explain the symbols that are used to draw a DFD. Draw and explain 1st level DFD for online shopping system. List any *six* limitations of DFDs.   10

(b) Explain how large system can be decomposed into sub-systems using horizontal or vertical partition with the help of an example.   10

4. (a) A university has post-graduate and under-graduate students. The post-graduate students can be research scholars or master degree students. The research scholar's can be scholarship holder and without any scholarship. The post-graduate and under-graduate students can be hostlers (who stay in hostel) or day

scholar (who do not stay in hostels). Draw the generalisation hierarchy of the student class. 5

(b) What are abstract classes ? How can they be related to concrete classes ? Explain with the help of an example. 5

(c) Draw an activity diagram for making an online banking transaction. Make suitable assumptions. 5

(d) What is the significance of a good design documentation ? What should be the contents of a good design document ? 5

5. Explain the following with the help of an example : 4×5=20

(a) Implementation of one-to-one unidirectional association

(b) Persistency of data, process and object

(c) Extended three schema architecture for object model

(d) Collaboration diagram

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Term-End Examination

June, 2023

MCS-219 : OBJECT ORIENTED ANALYSIS AND DESIGN

Time : 3 Hours   *Maximum Marks : 100*

Note : (i) Question **No. 1** is compulsory and carries 40 marks.

(ii) Attempt any **three** questions from the rest.

1. (a) An online admission system of a University provides facility to its prospective learner to apply for various UG and PG courses. During the application process applicants need to provide their basic details such as name, date of birth, mobile number, email-id and address. Also they need to upload

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their certificates for which system provides proper instructions and interfaces. Subsequent upon processing the applications received, university displays the list of selected candidates and also send them email regarding their selection. Applicants pay the fee online and their id cards are generated. Draw the following diagrams for this system. (You can make necessary assumptions, if required) :

(i) Use case diagram   5

(ii) Class diagram   5

(iii) Sequence diagram   5

(iv) State diagram   5

(b) What is DFD ? Draw upto level 1 DFD for the system described in Q1(a) above.   10

(c) What is generalization ? Explain how generalization is different from aggregation with the help of class diagram for 'Computer System'.   10

2. (a) Explain the concepts of links and association with the help of example. Also, discuss how associations are implemented.

   10

   (b) What is activity diagram ? Draw activity diagram for online shopping of mobile charger. 10

3. (a) What is deployment diagram ? What are components of deployment diagram ? Draw deployment diagram for "Online Admission System of a University". 10

   (b) What is object diagram ? Draw and explain object diagram for Saving Accounts in a Bank. 10

4. (a) What is concurrency control ? Explain need of concurrency control in a system with the help of an example. 10

   (b) Explain need of inheritance adjustment in designing of a system with the help of an example. 10

5. Write short notes on the following :   4×5=20

    (a)   Use of object ID

    (b)   Design Documentation

    (c)   Meta Data and Keys

    (d)   Basic philosophy of object orientation

- ➢ **What is object oriented analysis and design ? Explain its advantages.**

- ➢ **What is UML? What is the advantage of using UML? Can you name the types of modeling?**

- ➢ **Difference Between Structured analysis and object oriented analysis.**

- ➢ **Object Modeling**

- ➢ **Explain Dynamic modeling with example**

- ➢ **Explain functional modeling with example**

- ➢ **Concurrency Identification and manage**

- ➢ **Relational database vs. OO Database**

- ➢ **Inheritance and Abstraction**

- ➢ **How do we implement the concept of association ? Explain with an example.**

- ➢ **How is a one-to-many association different from a one-to-one association ?**

- ➢ **How multiple inheritance differs from multilevel inheritance ? Explain with**
suitable example for each.

- ➢ **Explain aggregation , generalization, specialization.**

- ➢ **Integrity Constraints**

- ➢ **Optimal Association**

➢ **Implementing association as class**

➢ **Explain persistency of data. What is serialization? Where it used and why?**

➢ **Relational Database for object models**

➢ **What is the use of object IDs ?**

➢ **Mapping object class to tables**

➢ **How to map association to tables**

➢ **How to map generalization to tables**

Use Case Diagram
Class Diagram
Object Diagram
Sequence Diagram
Collaboration Diagram
Activity Diagram
State chart Diagram
STATE MACHINES
Component Diagram
Deployment Diagram
Behavioral Diagram
Package Diagram
Data Flow Diagram(DFD)