

**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

- (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 : $4 \times 5 = 20$

(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