Full Marks: 40
Pass Marks: 18
Time: 2 hrs.

BIM / Seventh Semester / IT 227: Object Oriented Analysis and Design

Candidates are required to answer all the questions in their own words as far as practicable.

Group "A"

1. **Brief Answer Questions:**   [10 × 1 = 10]

   i.   What do you mean by low coupling?

   ii.   What is 'includes' in use case?

   iii. What are the strategies to find conceptual classes?

   iv.   When are Specification Conceptual Classes Required?

   v.   Why an activity diagram is needed in behavioral modeling?

   vi.   What is collaboration diagram?

   vii. Define adapter design pattern.

   viii. List any five GRASP patterns.

   ix.   Why high cohesive design is needed?

   x.   What do you mean by iterative development method?
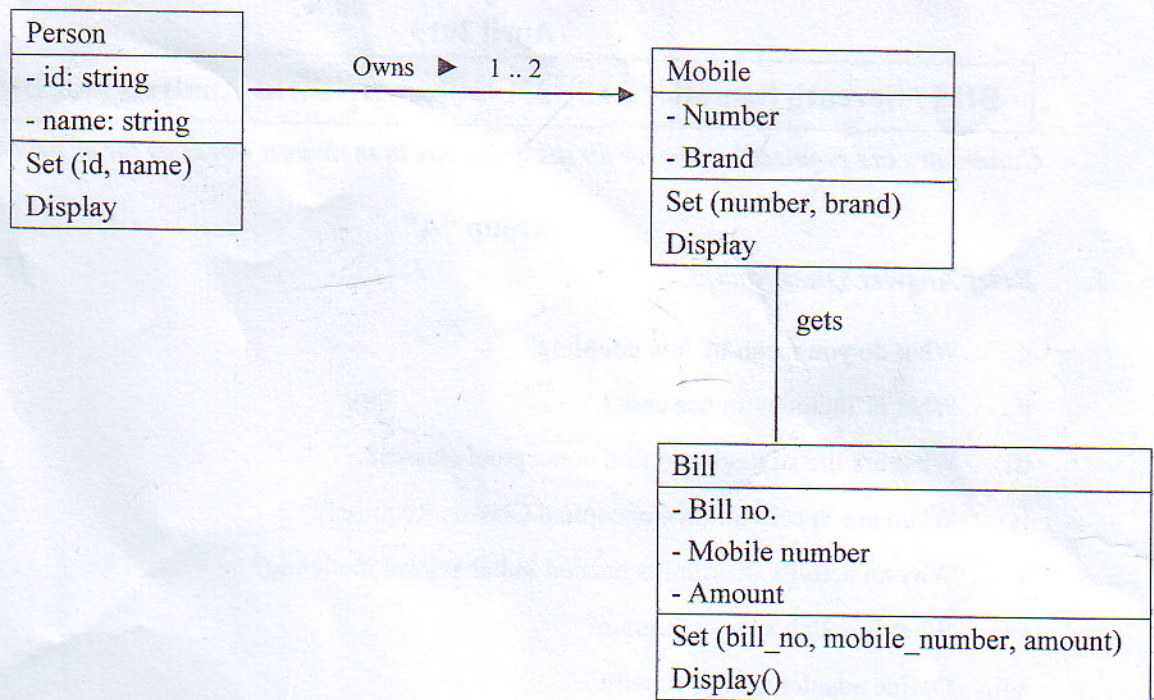
Group "B"

Exercise Problems: [5 × 4 = 20]

2. To give an exam, an instructor first notifies the students of the exam date and the material to be covered. She then prepares the exam paper (with sample solutions), gets it copied to produce enough copies for the class, and hands it out to students on the designated time and location. The students write their answers to exam questions and hand in their papers to the instructor. The instructor then gives the exam papers to the TAs, along with sample solutions to each question, and gets them to mark it. She then records all marks and returns the papers to the students. Draw a sequence diagram that represents this process.

3. Define information expert design pattern with example.

4. Consider the world of libraries. A library has books, videos, and CDs that it loans to its users. All library material has unique id and a title. In addition, books have one or more authors, videos have one producer and one or more actors, while CDs have one or more entertainers. The library maintains one or more copies of each library item (book, video or CD). Copies of all library material can be loaned to users. Reference-only material is loaned for 2hrs and can't be removed from the library. Other material can be loaned for 2 weeks. For every loan, the library records the user, the loan date and time, and the return date and time. For users, the library maintains their name, address and phone number. Draw a class diagram for the description above.

5. Explain factory pattern with code.

6. Write code (in any OOP) for given class diagram.

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┌─────────────────────┐                          ┌─────────────────────────┐
│ Person              │        Owns  ▶  1 .. 2   │ Mobile                  │
├─────────────────────┤ ────────────────────────▶├─────────────────────────┤
│ - id: string        │                          │ - Number                │
│ - name: string      │                          │ - Brand                 │
├─────────────────────┤                          ├─────────────────────────┤
│ Set (id, name)      │                          │ Set (number, brand)     │
│ Display             │                          │ Display                 │
└─────────────────────┘                          └─────────────────────────┘
                                                            │
                                                            │ gets
                                                            │
                                        ┌────────────────────────────────────┐
                                        │ Bill                               │
                                        ├────────────────────────────────────┤
                                        │ - Bill no.                         │
                                        │ - Mobile number                    │
                                        │ - Amount                           │
                                        ├────────────────────────────────────┤
                                        │ Set (bill_no, mobile_number, amount)│
                                        │ Display()                          │
                                        └────────────────────────────────────┘
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Group "C"

Comprehensive Questions: [2 × 5 = 10]

7. Explain importance of iterative and evolutionary development method.

8. Do you think design patterns are necessary to consider in software development? Explain any one design pattern in your knowledge and how is it valuable.

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