

**Indian Institute of Technology Roorkee**  
**Department of Computer Science and Engineering**  
**Mid-Term Examination, B.Tech. II (CSE) July-Dec, 2023**  
**Object Oriented Analysis and Design CSN-291**

**Maximum Marks: 25**

**Time Allowed: 1.5 Hours**

Read the following instructions carefully:

1. Attempt ALL questions.
2. Attempt all parts of a question together. Attempt questions in the same order as given in the question paper. Follow this instruction strictly.
3. In addition to correctness of answer, the quality of the answer will also be considered during evaluation.

Q1: Answer following as specified:

- (a) [Fill in the blank and explain any three commonly used accessible level with example] The interface of a class is divided into four accessibility levels. A declaration that is accessible only to the class itself and its subclasses is called as ..... [1+1\*3=4 Marks]
- (b) [True/False and explain static typing with example] Static typing means that the types of all variables and expressions are fixed at the time of compilation. [1+2=3 Marks]
- (c) [Fill in the blank and explain each construct with the help of corresponding example and flow-chart] A program is called structured when it uses only the following three types of constructs: ....., ....., ..... [1\*3= 3 Marks]

Q2: Complexity of the problem domain is an important element causing inherent complexity of the software. Specify at least two factors causing complexity of the problem domain.

[2 Marks]

Q3. If a class A is associated with another class B, then can object of class A invoke the methods of the corresponding object of the other class B? Give an example using any programming language to support your answer. [3 Marks]

Q4. Attempt following questions:

- a) With reference to object, explain the relationship between responsibility of an object and the methods of an object. Can there be multiple methods for a single responsibility? Explain with the help of an example using any programming language or pseudocode.

[1+2= 3 Marks]

- b) During mapping of functions into modules during high level design, specify at least two criteria that a designer need to follow to decide the module into which the function is to be put for generating the quality design.

[2 Marks]

- c) What is the meaning of term 'data type' in software design and development? Why Class is considered as an abstract data type?

[3 Marks]

- d) With the help of diagram and appropriate example, show how the inheritance is represented diagrammatically.

[2 Marks]

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