Sub Code: RIT053

Paper Id: | **113503** | **Roll No:** | | | | | | | | | | | | |

B TECH
(SEM V) THEORY EXAMINATION 2019-20
OBJECT-ORIENTED TECHNIQUES

Time: 3 Hours   *Total Marks: 70*
Notes:
- *Attempt all Sections.*
- *Assume any missing data.*

SECTION A

1.   **Attempt *all* questions in brief.**   **2 x 7 = 14**

a.   Define programming paradigms. List the programming paradigms.
b.   Differentiate Procedural programming between OOP with example.
c.   Define Abstraction and Encapsulation with example.
d.   Define class diagram. Draw a class diagram for university.
e.   Define sequence diagram. Draw a sequence diagram for making a cup of tea.
f.   Discuss callback mechanism.
g.   Differentiate Macro and Inline functions.

SECTION B

2.   **Attempt any *three* of the following:**   **7 x 3 = 21**

a.   Discuss polymorphism. How polymorphism is implemented in C++? Discuss with suitable code. Differentiate virtual and pure virtual functions with example.
b.   Explain how data conversion is done from one class to another class. Write a program in C++.
c.   Discuss and Compare SA/SD and JSD with OMT methodology.
d.   Explain inheritance with its different types. Write a program in C++ to demonstrate multi-level inheritance.
e.   Describe the relation of functional model, object model and dynamic model. What is relationship and difference between OOA and OOD?

SECTION C

3.   **Attempt any *one* part of the following:**   **7 x 1 = 7**

(a)   Explain Object-Oriented Techniques in terms of abstraction, inheritance, encapsulation & polymorphism with the help of suitable examples.
(b)   What do you mean by UML? Discuss the conceptual model of UML with the help of an appropriate example.

4.   **Attempt any *one* part of the following:**   **7 x 1 = 7**

(a)   Discuss collaboration diagram. Explain polymorphism in collaboration Diagrams with example.
(b)   Discuss State Machine diagram. What is Event and signals? Is any difference between Time diagram and state machine diagram? Justify your answer.

5.   **Attempt any *one* part of the following:**   **7 x 1 = 7**

(a)   Differentiate between data abstraction and data encapsulation Define a class called employee with the following specifications:

States: Name, BP (Basic salary), DA (Dearness allowance), HRA (House rent allowance), salary

Behaviors:

> **computeSal ()**: computes the salary
> **readData ()**: accepts the data value
> **dispSal ()**: prints the data on the screen

The salary is computed by the following formula:

$$Salary = BP + DA + HRA$$

Where DA and HRA are 65% and 20% of the BP respectively.

Write a program in C++ to demonstrate the default constructor, parameterized constructor and constructor overloading. The program reads the name and BP (basic salary) of the employee and print the salary.

(b)   Discuss documentation. What are the various considerations in documentation designing? Explain depicting asynchronous messages with/without priority.

6.   **Attempt any _one_ part of the following:**   **7 x 1 = 7**

(a)   Explain virtual base class in inheritance. Define a class called student which models the following states and behaviors of a student:

> **States**: Name, Roll, Marks, Grade
> **Behaviors**: Read_data (), Display_data (), Compute_grade ()

Write a program in C++ for demonstration to compute the grade as per the following rules:

Marks	Grade
>=50<60	D
>=60<70	C
>=70<80	B
>=80	A

(b)   Explain operator overloading. Write a program to overload + operator.

7.   **Attempt any _one_ part of the following:**   **7 x 1 = 7**

(a)   Discuss pointer. What is pointer reference? Write a C++ program to assign some values to the member of class objects using pointer structure ($\rightarrow$).

(b)   Differentiate between constructors and destructors. Explain the use of constructors and destructor with suitable examples. How we override a constructor?