

II B. Tech I Semester Regular Examinations, March - 2021
OBJECT ORIENTED PROGRAMMING THROUGH C++
 (Computer Science & Engineering)

Time: 3 hours

Max. Marks: 75

Answer any **FIVE** Questions each Question from each unit
 All Questions carry **Equal** Marks
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|----|----|--------------------------------------------------------------------------------------------------------------------------|-----|
| 1  | a) | What are the drawbacks of procedural languages? Explain the need of Object-Oriented programming with a suitable example. | 8M  |
|    | b) | Describe the features of Object-Oriented Programming.                                                                    | 7M  |
| Or |    |                                                                                                                          |     |
| 2  | a) | Write the most significant differences between C and C++.                                                                | 5M  |
|    | b) | Explain in detail the four major principles of Object-Oriented Programming paradigm with suitable examples.              | 10M |
| 3  | a) | What are objects and how they are created from Class? Explain with a sample program.                                     | 8M  |
|    | b) | Explain about the different mechanisms in C++ to protect the members of an object.                                       | 7M  |
| Or |    |                                                                                                                          |     |
| 4  | a) | What is a Constructor? What is the main purpose of Constructors? How to invoke a constructor in C++? Explain.            | 10M |
|    | b) | Explain the principles and benefits of method overloading in C++ programming.                                            | 5M  |
| 5  | a) | What is the significance of inheritance? Explain various types of inheritance with suitable example for each.            | 15M |
| Or |    |                                                                                                                          |     |
| 6  | a) | Why do we use virtual base class in C++? Give explanation.                                                               | 5M  |
|    | b) | Write a C++ program to illustrate the importance of overloading Binary operator '+' for adding two complex numbers.      | 10M |
| 7  | a) | What is meant by Dynamic binding? And also Explain its implementation in C++ with a sample program.                      | 15M |
| Or |    |                                                                                                                          |     |
| 8  | a) | Define Pointer. How to declare, initialize and access pointers in C++? Explain.                                          | 8M  |
|    | b) | Write the differences between virtual and pure virtual functions in C++.                                                 | 7M  |
| 9  | a) | What is Exception Handling? Explain various keywords involved in C++ exception handling.                                 | 8M  |
|    | b) | Write a C++ program to sort an unordered list of elements using function templates.                                      | 7M  |
| Or |    |                                                                                                                          |     |
| 10 | a) | Explain in detail about the four important components of C++ Standard Template Library.                                  | 15M |

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- 1 a) Explain the limitations of conventional procedural programming. 8M
 b) Describe the characteristics of Object-Oriented Programming 7M

Or

- 2 a) Explain about Inheritance and Polymorphism features of Object Oriented Programming. 8M
 b) Mention the promising application areas of Object-Oriented Programming in real time environment. 7M
- 3 a) What are objects and how they are created from class? Explain with a C++ program. 8M
 b) Describe the special characteristics of Constructors with a C++ program. 7M

Or

- 4 a) Why do we need Nested classes in C++ programming? Write a C++ program to demonstrate the necessity of nested classes. 8M
 b) Discuss the characteristics of Destructor in C++ programming. 7M
- 5 a) How does inheritance help achieve code reuse? Explain. 5M
 b) Explain various forms of inheritance supported by C++. 10M

Or

- 6 a) Write a C++ program to illustrate the importance of overloading Binary operator '-' to subtract two complex numbers. 12M
 b) Mention the list of operators which cannot be overloaded in C++. 3M
- 7 a) How does C++ achieve compile time polymorphism? Explain. 8M
 b) Write a C++ program to demonstrate dynamic method dispatch in C++. 7M

Or

- 8 a) How do you declare a pointer to an object in C++? Explain with an example program. 8M
 b) Explain the purpose of Virtual destructors in C++ with a sample program. 7M
- 9 a) What is Exception Handling? Explain various keywords involved in C++ exception handling. 8M
 b) What is Function template? Can a class member function template be virtual? Explain. 7M

Or

- 10 a) How are templates different from macros? Explain. 8M
 b) Explain in detail about iterators in C++. 7M

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|----|----|---------------------------------------------------------------------------------------------------------------------------|-----|
| 1  | a) | What are the advantages and disadvantages of procedural programming?                                                      | 8M  |
|    | b) | What are Objects and Classes in Object Oriented Programming? Explain.                                                     | 7M  |
| Or |    |                                                                                                                           |     |
| 2  | a) | Write the differences between C and C++ programming.                                                                      | 8M  |
|    | b) | What is Data Abstraction and Encapsulation in C++? Explain with a real time example.                                      | 7M  |
| 3  | a) | Explain about access specifiers in C++ programming.                                                                       | 8M  |
|    | b) | What is a constructor? Explain various forms of constructors with suitable example.                                       | 7M  |
| Or |    |                                                                                                                           |     |
| 4  | a) | What are the benefits of Method overloading in programming? Explain the concept of Method overloading with a C++ program. | 10M |
|    | b) | Is it possible to call destructor explicitly in C++? Give explanation with a sample code.                                 | 5M  |
| 5  | a) | What is inheritance? List the different types of inheritance and explain how it encourages reusability and sharing?       | 15M |
| Or |    |                                                                                                                           |     |
| 6  | a) | What are Virtual classes? Explain the need for Virtual classes with a suitable example.                                   | 8M  |
|    | b) | Write the rules of overloading operators in C++.                                                                          | 7M  |
| 7  | a) | Why Polymorphism is needed in programming? Explain about the types of polymorphism with necessary example C++ programs.   | 15M |
| Or |    |                                                                                                                           |     |
| 8  | a) | What is a class pointer? What is the size of an object pointer? Give explanation.                                         | 8M  |
|    | b) | Explain about virtual functions in C++ with a program.                                                                    | 7M  |
| 9  | a) | Write about Exception handling in C++ with an example program.                                                            | 8M  |
|    | b) | Explain the concept of rethrowing exceptions in C++.                                                                      | 7M  |
| Or |    |                                                                                                                           |     |
| 10 | a) | Differentiate between templates and macros.                                                                               | 5M  |
|    | b) | With an example, explain various types of container classes in C++.                                                       | 10M |

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|----|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 1  | a) | Is object-oriented programming better than procedural programming? Explain.                                                                                                                                                                                                                                                                                        | 8M  |
|    | b) | What is meant by Data encapsulation in Object Oriented Programming? How does Data Encapsulation ensure data security? Explain.                                                                                                                                                                                                                                     | 7M  |
| Or |    |                                                                                                                                                                                                                                                                                                                                                                    |     |
| 2  | a) | Explain in detail about Class, Objects, Methods and Messages.                                                                                                                                                                                                                                                                                                      | 8M  |
|    | b) | Discuss the importance of Polymorphism with a suitable example.                                                                                                                                                                                                                                                                                                    | 7M  |
| 3  | a) | Explain the concept of constructors and destructors in detail with an example program.                                                                                                                                                                                                                                                                             | 15M |
| Or |    |                                                                                                                                                                                                                                                                                                                                                                    |     |
| 4  | a) | Create a class in C++ program to print the area of a square and a rectangle. The class has two methods with the same name but different number of parameters. The method for printing area of rectangle has two parameters which are length and breadth respectively while the other method for printing area of square has one parameter which is side of square. | 8M  |
|    | b) | What are the design considerations that might cause one to use an Anonymous object? What are the advantages and disadvantages?                                                                                                                                                                                                                                     | 7M  |
| 5  | a) | Why do we need pure virtual function in C++?                                                                                                                                                                                                                                                                                                                       | 5M  |
|    | b) | Write a C++ program to overload the binary operator '+' to Concatenate two strings                                                                                                                                                                                                                                                                                 | 10M |
| Or |    |                                                                                                                                                                                                                                                                                                                                                                    |     |
| 6  | a) | What is the significance of inheritance? Explain various types of inheritance with suitable example                                                                                                                                                                                                                                                                | 10M |
|    | b) | What is an Abstract class? Explain the importance of Abstract classes with a sample C++ program.                                                                                                                                                                                                                                                                   | 5M  |
| 7  | a) | Write a C++ program to illustrate the importance of 'this' pointer.                                                                                                                                                                                                                                                                                                | 8M  |
|    | b) | Explain about run time polymorphism in C++ with a sample program.                                                                                                                                                                                                                                                                                                  | 7M  |
| Or |    |                                                                                                                                                                                                                                                                                                                                                                    |     |
| 8  | a) | What is meant by function binding in programming? Explain about Early and Late binding in C++.                                                                                                                                                                                                                                                                     | 8M  |
|    | b) | Why do we need Virtual destructors in C++? Explain.                                                                                                                                                                                                                                                                                                                | 7M  |
| 9  | a) | What do you mean by an Exception and Error? Explain about the keywords related to exception handling in C++.                                                                                                                                                                                                                                                       | 8M  |
|    | b) | How to define User-defined Exceptions in C++? Explain with a sample code snippet.                                                                                                                                                                                                                                                                                  | 7M  |
| Or |    |                                                                                                                                                                                                                                                                                                                                                                    |     |
| 10 |    | How many associative containers are provided by C++? Explain.                                                                                                                                                                                                                                                                                                      | 15M |