	Utech
Name:	
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Invigilator's Signature :	

# **OBJECT ORIENTED PROGRAMMING WITH C++**

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

## **GROUP - A**

# ( Multiple Choice Type Questions )

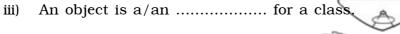
1. Choose the correct alternatives for any ten of the following:

 $10 \times 1 = 10$ 

- i) Class A : public B, public Cis an example of what kind of inheritance ?
  - a) Single

- b) Multiple
- c) Hierarchical
- d) Multilevel.
- ii) A friend function can be called
  - a) by using object of the class
  - b) should not be called
  - c) by using the class name
  - d) directly like normal function.

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- a) template
- b) friend
- c) instance
- d) none of these.
- iv) Consider the following statements:
  - I. A reference variable provide an alias to a previously defined variable.
  - II. Friend function can only be declared in the public section.
  - III. A static member function does not have 'this' pointer.
  - IV. New operator cannot be overloaded.

Which of the following statements is / are ture?

- a) Only I
- b) I and III
- c) II and III
- d) II and IV
- e) None of these.
- v) A pure virtual function is a virtual function with which of the following?
  - a) Complex constructors
  - b) No syntax error
  - c) No body
  - d) None of these.



vi)	Con	astructor can be	Oregan	
	a)	virtual	In Planting (5' Knowledge 3nd Explained	
	b)	with only return type void		
	c)	generated by default if not programmer	rovided by the	
	d)	none of these.		
vii)	ii) What will be the output of the following code ? Class XYZ $\{ \text{ int } x; \}$			
		Public: void func ( ) delete t	his; } };	
	main ( ) { XYZx; x.func ( ); }			
	a)	runtime error b) compilat	ion error	
	c)	no error d) nothing.		
viii)		A class A has a member function show ( ). Let obj is an object of A and ptr is a pointer to A. Which of the		
	following is / are valid access statements?			

c) ptr -> show ( ); d)

obj.show(); b) (\* ptr ).show();

all of these.

a)

- ix) Which of the following is false?
  - a) In C++ no static variable can be member of a union
  - b) In C++ static member function may not be virtual
  - c) In C++ a union can have virtual member function
  - d) All of these.
- x) The major goal of inheritance in C++ is to
  - a) facilitate the conversion of data types
  - b) hide the details of base class
  - c) facilitate the reusability of code
  - d) help modular programming.
- xi) In protected derivation, accessibility of base members undergoes which of the following changes in the derived class?
  - a) Public becomes protected
  - b) Public becomes private
  - c) Protected becomes private
  - d) Private is not inherited.
- xii) .Which is the default access specifier of a structure in  $C++\ ?$ 
  - a) Private

- b) Public
- c) Protected
- d) None of these.

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## **GROUP - B**

## (Short Answer Type Questions)

Answer any three of the following.

 $3 \times 5 = 15$ 

- 2. a) What is function overriding? Explain with an example.
  - b) How is it different from function overloading? 3 + 2
- 3. Differentiate the following:
  - a) free ( ) and delete
  - b) friend function and static member function.
- 4. a) What is virtual destructor? Why is it useful?
  - b) Is it possible to have a virtual constructor? Explain.

3 + 2

- 5. a) What is 'this' pointer? Write a program to return an object using 'this' pointer.
  - b) What is a const member function? Why is it used?

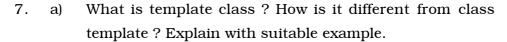
3 + 2

- 6. a) What is operator overloading? Mention some rules for overloading operators.
  - b) Write a program to overload + and operators as unary operator. 3 + 2



#### (Long Answer Type Questions)

Answer any *three* of the following.  $3 \times 15 = 45$ 



- b) Write a program to create a template function for Bubble sort.
- c) How is template function advantageous over function overloading?
- d) Explain data abstraction and data encapsulation.

3 + 6 + 3 + 3

- 8. a) Differentiate 'has a' and 'is a' relationship with example.
  - b) Write a program in C++ to overload [ ] operator.
  - c) Explain the following type conversions with suitable examples:
    - i) From basic to user-defined
    - ii) From user-defined to basic
    - iii) Conversion between objects of two different classes. 3 + 4 + 8
- 9. a) Write a program in C++ to modify a student record from a student's database and display the records after modification applying file handling.
  - b) What is a friend member function? Explain citing an example.
  - c) Write a program to define a class string and overload= =, > and < operator to compare two String objects.</li>

7 + 4 + 4

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- 10. a) What do you mean by a default arguments function? Explain.
  - b) What is an inline function? Mention its advantages and pitfalls.
  - c) Explain the visibility of base class members in the derived class. When is the base class inherited as private or public or protected?
  - d) What are the ambiguities that arise in multiple and diamond-shaped inheritance? How can they be resolved? 2+4+5+4
- 11. Write short notes on any *three* of the following:  $3 \times 5 = 15$ 
  - i) STL
  - ii) static\_cast operator
  - iii) Hierarchy of stream classes
  - iv) Virtual function
  - v) Exception handling.

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