

END TERM EXAMINATION

THIRD SEMESTER [BCA] DECEMBER-2009

Paper Code: BCA209

Subject: Object Oriented Programming

Paper Id-20209

Time : 3 Hours

Maximum Marks :75

Note: Attempt all questions.

Q1 Attempt all parts of the following:-

- (a) What is the purpose of copy constructor? (2.5)
- (b) Differentiate between the compile time binding and run-time binding. (2.5)
- (c) Consider the definition of the following function template: (3)
- ```
Template<class X>
X wow (X x, X y) {return x+y;}
Find and explain the output of the following statements:-
(i) cout << wow (5,7) << endl;
(ii) string s1="sunny"; string s2=" day"; cout<<wow (s1,s2)<<endl;
```
- (d) Write a recursive function to multiply two positive integers using m and n using repeated additions. (4)
- (e) List differences between virtual classes and virtual functions. (3)
- (f) What are namespaces? What are their advantages? (3)
- (g) What are virtual destructors? Explain and give a suitable example. (3)
- (h) List differences between free()/delete pair and malloc()/calloc() pair. (4)

Q2 Attempt **any one** part of the following:-

- (a) (i) What are abstract classes? Explain their advantages. How are they created? Show by suitable example. (3)
- (ii) How does the const differ in C++ from C? (3)
- (iii) Explain the volatile keyword of C++ with suitable example. (2)
- (iv) Explain the initialization list method for initialization of class data members through the constructors. (4.5)
- (b) Create a string class to create empty strings or create strings from other strings passed as argument to its constructor. Memory allocation for creation and disposal of strings will be dynamic. The string class will have one char pointer to point the string and member length to hold the length of this string. Write the- (12.5)
- (i) Constructors and destructors for this class.
- (ii) Overload the + operator to find the concatenation of strings s1 and s2 into string s3 by the statement s3=s1+s2;
- (iii) Overload the operator < to compare two strings in the statement: if (s1<s2).
- (iv) Show () method to print the strings right aligned on the screen.

Q3 Attempt **any one** part of the following:-

- (a) (i) Differentiate between aggregation and composition with suitable examples. (3)
- (ii) Write down the syntax for defining a member function outside the class specification. How these functions can be made inline? (3)
- (iii) Discuss the method and syntax for calling constructors of base classes in multilevel inheritances with suitable example. Take at least two levels of inheritance. (6.5)

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- (b) Create a matrix class to:- (12.5)
- (i) Dynamically create a matrix of order  $m \times n$ .
  - (ii) To read the elements into it through the keyboards.
  - (iii) To multiply two matrices of orders  $m \times n$  and  $n \times p$ .
  - (iv) To initialize one matrix from another matrix using the copy constructor.
  - (v) To delete a matrix explicitly using the destructor.
  - (vi) To print a matrix on the display.

Q4 Attempt **any one** part of the following:-

- (a) (i) Discuss methods to overload the unary, pre-increment++ and post-increment++ operators. (4.5)
- (ii) Explain the nested classes with suitable example. (4)
- (iii) What is this pointer? What happens on the execution of the statement: delete this; in a class. Write a program demonstrating the use of this pointer. (4)
- (b) (i) Discuss the ways to convert one object into another object. (3)
- (ii) Design classes called polar and rectangle for representing a point in polar and rectangle systems. Support data conversion functions to support statements such as: rectangle r1, r2; polar p1, p2; r1=p1, p2=r2; (9.5)

Q5 Attempt **any one** part of the following:-

- (a) (i) Explain the exception handling mechanism of C++. (4.5)
- (ii) Discuss the ostream, istream and other stream classes starting with ios class. (2.5)
- (iii) Write a program using class for opening text file and counting the words and lines in it. (5.5)
- (b) (i) Explain the persistent objects. (2)
- (ii) Write a generic class to sort n items into ascending order. Items are read through the keyboard. (4)
- (iii) Explain the working of seekg(), seekp(), tellp(), tellg(), read(), write(), bad(), good() functions in stream classes. (6.5)

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