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Code No. : 12007 O2

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. I Year II-Semester Backlog Examinations, May-2017

Object Oriented Programming using C++

Time: 3 hours

Max. Marks: 50

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (15 Marks)

1. Predict the output of the following nested loops. [1]

```
int n,m;  
for(n=1;n<=10;n++)  
  for(m=10;m>=1;m--)  
    cout<<n<<"times"<<m<<"="<<n*m<<endl;
```
2. How are data and functions organized in object oriented programming? [1]
3. Write overloaded function 'max' that takes either two or three parameters and returns the largest of them. [1]
4. How default constructors and destructors behave in inheritance hierarchy. [1]
5. Define the term exception. How is it handled in C++? [1]
6. What is the output of the following code? [2]

```
int foo(int x)  
int p=1;  
while (x>0)  
{  
  p=x*p;  
  x--;  
}  
return p;  
}
```
7. What is a class? How does it accomplish data hiding? [2]
8. When do you call copy constructors? Mention the three cases. [2]
9. Using 'this' pointer compare two objects of person class and return the elder of two persons. [2]
10. Define a function peep to display the topmost element from the stack. Assume stack is implemented using an array. [2]

Part-B (5 × 7 = 35 Marks)

11. a) Briefly explain five main features of object oriented programming. [4]
- b) Write a program to read the total marks a student scored from 10 subjects and display his grade. The following rules apply: [3]
If total marks ≥ 91 grade is A+, if ≥ 81 and < 91 grade is A
If ≥ 71 and < 81 grade is B+, if ≥ 61 and < 71 grade is B
If ≥ 51 and < 61 grade is C, if ≥ 41 and < 51 grade is D else failed.
Student who got marks between 36 and 40 should be given grace marks and then the grade to be decided. If he gets 36 marks grace is 5 marks, or if it is 37, grace is 4 marks and likewise.

12. a) What are static data members of a class? How are they different from normal members of the class? [3]
- b) Write a function definition for 'add tax'. The function has two formal parameters: tax rate which is the amount of sales tax expressed as a percentage and a list which is the cost of items before tax. The function changes the cost of items so that it includes sales tax. [4]
13. a) Can constructors be overloaded? If yes what are the different ways of overloading constructors? [3]
- b) Write a class to represent complex numbers (numbers having the real part and the imaginary part). Also add the following member functions to the class: [4]
- constructor to initialize the members of the class
 - to display the complex number
 - overload + operator to add two complex numbers.
14. a) Explain about runtime polymorphism. How is it implemented in C++? Explain with the help of example, the use of private, public and protected access modifier's. [4]
- b) Define a class PartFilledArrayMax that is derived of PartFilledArray which has an array as a member in base. Derived class has one additional member variable named max value that holds the maximum value stored in the array. Define a member function 'getmax' that return max value stored in the array. Define constructors including copy constructor. [3]
15. a) What is a Queue? Explain its operations with example. [4]
- b) Write a program to implement bubble sort Define a class ArrayoutofBounds and throw the exception if the function bubble sort tries to access the array beyond its boundaries. [3]
16. a) Explain about the various control structures in C++. [4]
- b) Write a program to read from a file named names.txt and display it on the monitor. Display the message "File cannot be opened" if the file cannot be opened successfully. [3]
17. Write short notes on any *two* of the following: [7]
- Dynamic arrays
 - Overriding
 - Linked list.
