

22393

23124

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following :

10

- (a) Write any four applications of OOP.
- (b) Explain user defined datatype with example.
- (c) Write any two characteristics of destructor.
- (d) Write any three rules of operator overloading.
- (e) Define the terms: linear data structure and non-linear data structure.
- (f) Explain the need of linked list.
- (g) List any 4 applications of queue.



2. Attempt any FOUR of the following :**12**

- (a) Write a C++ program to accept array of five elements, find and display smallest number from an array.
- (b) Write a C++ program to declare a class book with data members as book name and price. Declare a constructor to initialize data member of class. Display the data.
- (c) What is inheritance ? Give different types of inheritance.
- (d) Explain the procedure for insertion and deletion of an element in Queue.
- (e) Differentiate between stack & queue with respect to,
 - (i) principle
 - (ii) variables
 - (iii) operation performed
 - (iv) time complexity

3. Attempt any FOUR of the following :**12**

- (a) Write a C++ program to print Fibonacci series.
- (b) Describe how memory is allocated to objects of class with suitable diagram.
- (c) Differentiate between run time polymorphism and compile time polymorphism.
- (d) Describe working of bubble sort with example.
- (e) Find the position of element 29 using binary search method in an array 'A' given below. Show each step.

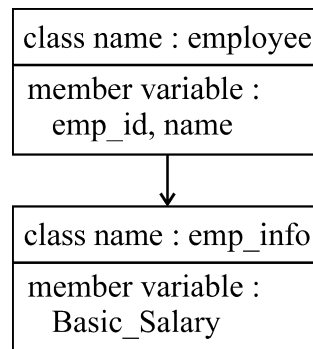
A = {11, 5, 21, 3, 29, 17, 2, 43}

4. Attempt any THREE of the following :**12**

- Differentiate between OOP and POP.
- Describe use of static data member in C++ with example.
- Write a C++ program to declare a class college with member as college code. Derive a new a student with member as studied. Accept and display detail of student along with college for three students.
- Describe working of linear search with example.
- Write the procedure to implement stack using linked list.

5. Attempt any THREE of the following :**12**

- Explain parameterized constructor with an example.
- Write a program to implement single inheritance from the following, refer figure No.-1 :

**Figure No. 1**

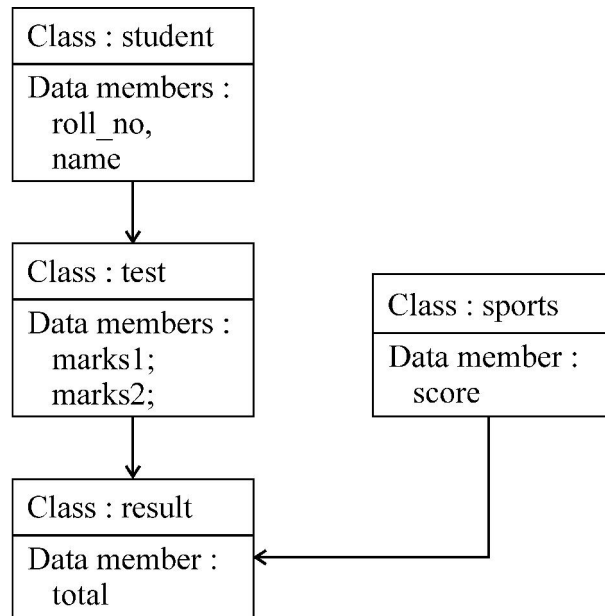
- Write a program to calculate the value of the following series using external member function :

$$S = 1^2 + 2^2 + 3^2 + 4^2 \dots\dots + n^2$$
- Show the effect of PUSH and POP operations on the stack of size 10.
 PUSH (10)
 PUSH (20)
 POP
 PUSH (30)
- Describe the concept of linked list with the terminologies : node, next pointer, null pointer and empty list.

P.T.O.

6. Attempt any TWO of the following :**12**

- (a) Write a C++ program to declare a class student with members as roll_no, name and department. Declare a parameterized constructor with default value for department as 'TE' to initialize members of object. Initialize and display data for two students.
- (b) Write a program to implement the following hierarchy using suitable member functions. Refer Figure No. 2.

**Figure No. 2**

- (c) Describe the working of selection sort method. Also sort given input list in ascending order using selection sort.

Input list : 50, 24, 5, 12, 30
