Roll Number: _____

Thapar University, Patiala

Department of Computer Science and Engineering

END SEMESTER EXAMINATION

B. E. (First Year): Semester-I (2016-17)	Course Code: UTA-007 Course Name: Computer Programming-I
December 05, 2016	Monday, 2:00 – 5:00 pm
Time: 3 Hours, M. Marks: 100	Name of Faculty: RIR, SHB, MAK,GEK, ASG, VIK, SLP, HSP, SES, TAM, AKP, RUA

E-Block 02 Second floor

Note: Attempt all questions in sequence. Assume missing data (if any).

Q. 1 a) Consider the program given below using **for loops.** Rewrite the program by replacing both the for loops with **while loops**. (4)

```
#include <iostream>
int main()
{
    int i, j;
    for(i=15; i>0;)
    {
        cout<< i<< '\n';
        for(j=i-1; j>0; )
        {
            cout<<"#"<< '\n';
            j = j - 1;
        }
        i = i - 1;
    }
    return 0;
}
```

b) Explain the role of jump statement in a program along with the example. (3)

c) Write the output of the following code : (3)

```
#include<iostream>
int main()
{
  int i=1;
  for(;;)
  {
    cout<< i++<< '\n';
    if(i>10)
      break;
  }
  return 0;
}
```

Q. 2 a)	What is a pointer in C++? Elaborate with examples why are pointers required?	(3)
b)	What will be the output of the following program : #include<iostream> int main() { enum days {MON= -1, TUE, WED=6, THU, FRI, SAT}; cout<<MON<<TUE<<WED<<THU<<FRI<<SAT; return 0; }	(2)
c)	Write a program to find the frequency of a character in a string. The program takes two inputs from the user, first is a string and second is a character whose frequency is to be determined. The output prints the character and its computed frequency. Example: If user has entered a string "Thapar University" and a character 'i', then the output will be "Frequency of i is 2".	(5)

Q. 3 a)	Give the output of following code :
	#include <iostream.h>
	union unionJob
	{
	char name[32];
	float salary;
	int workerNo;
	} uJob;
	struct structJob
	{
	char name[32];
	float salary;
	int workerNo;
	} sJob;
	int main()
	{
	cout<<"size of union"<<sizeof(uJob);
	cout<< "size of structure"<<sizeof(sJob);
	return 0;
	}
		(3)

b)	What are **static** data members and static member functions? Write a program in C++ to count the number of objects created for a given class using **static** data member(s) and static member function(s).	(3+ 4)
Q. 4 a)	Define constructor. Discuss various types of constructors along with their features.	(6)
b)	Write a program in C++ to calculate cube of a given number using copy constructor.	(4)
Q. 5 a)	What is operator overloading? Write any two operators that cannot be overloaded.	(2)
b)	Write a program to define a class **time** having three integer data members hours, minutes and seconds, a member function **read()** to read the values, member operator function to add time, member function **print()** to display time in HH:MM:SS format. Write a main function to add two time objects using operator overloading and display the results in HH:MM:SS format.	(8)

Q. 6 a) What is function overloading? Write a program in C++ to calculate the area of a circle, rectangle and triangle using function overloading. **(2+5)**

b) For each of the following programs either identify compile time errors in the program or indicate the program output : **(3)**

```
int main()
{
int n;
int *p=&n;
*p=9;
cout<<n;
cout<<*p<<"\n";
return 0;
}
```

```
int main()
{
 int x[]={16,23,34,45};
 int *p;
 p=&x;
 return 0;
}
```

```
int main()
{
int x=12;
int &p1=x;
cout<<p1;
return 0;
}
```

Q. 7 a) Design a class named '*student*' having **(6)**

- private data members:- *roll number, name and total marks*
- public member functions:-

void getData(); // get student data from user

void displayData(); // display data

Write main() function demonstrating the concept of **File I/O** by writing and reading 3 objects (of the class *student*) to and from the file named *'objects.txt'*.

b) What are file modes? List any three file modes with their purpose. **(1+3)**

Q. 8 a) Design a **macro** (using preprocessor directives) to find greater of two numbers. **(2.5)**

b) Write output of the following code : **(2.5)**

```
#define PRODUCT(x) ( x * x )
int main( ){
int i = 3, j ;
j = PRODUCT( i +1) ;
cout<< j ;
return 0;
}
```

c) What is inheritance? Explain various types of inheritance in C++. **(5)**

Q. 9 Write a program demonstrating Hierarchical inheritance to calculate square and cube of a number having following components **(10)**

Class name	**Private data member**	**Public member function**
Number	num	void getNumber() int returnNumber()
Square	-	int getSquare()
Cube	-	int getCube

Q.10 a) Differentiate between the following with suitable examples : **(10)**

i) Formal and actual parameters

ii) Call by Value and Call by Reference

b) Explain the following :

i) Friend Function

ii) Structure and Union