Thapar Institute of Engineering and Technology, Patiala
Department of Computer Science and Engineering

B.Tech . (1st Year): Second Semester	Course Code: UTA018
	Course Name: Computer Programming-II
May 16, 2018	Wednesday, 14:00-17:00 Hrs
Time: 3 Hours, M. Marks: 100	Name of Faculty: RK, VIK, ASG, SES, SP, VA,
End Semester Test	ANK, RKG, SHG, SMA, AKM, PCH, RKR, HSP,
	NKA, DM.

Note: Attempt all questions in proper sequence. Assume missing data, if any, suitably.

Q1(a)	What will be the output of the statements (6,7,8,9,10) in the below program? Explain each output with proper justification. 1. #include<iostream> 2. using namespace std; 3. int main() 4. { 5. int i=5, j=7.0; 6. std::cout << j << "\n"; 7. std::cout << i+j << "\n"; 8. std::cout << j / i << "\n"; 9. std::cout << 5.0 / j << "\n"; 10. std::cout << (double) j / i << "\n"; 11. return 0; 12. }	10
1(b)	Explain with diagram, the various phases involved in the complete lifecycle of a C++ program from the source file to executable file.	6
Q2(a)	What are various access modes used in inheritance? Show the visibility of each in different mode of inheritance in the form of a table.	6
Q2(b)	Write the output of following code:	4
	```cpp #include<iostream> using namespace std; class Base {public: ~Base() {cout<<"C++ programming\n";} virtual void show() { cout<<" In Base \n"; } }; class Derived: public Base {public: void show() { cout<<"In Derived \n"; } };``` ```cpp int main(void) { Base *bp, b; Derived d; bp = &d; bp->show(); bp = &b; bp->show(); return 0; }```	
Q3(a)	Assuming that a text file named FIRST.TXT contains some text written into it, write a function named vowelwords(), that reads the file FIRST.TXT and creates a new file named SECOND.TXT, to contain only those words from	7

	the file FIRST.TXT which start with a lowercase vowel (i.e., with 'a', 'e', 'i', 'o', 'u').	
Q3(b)	What are file modes? List any four file-modes with their purpose.	5
Q3(c)	Discuss the usage and signature of seekg() in detail with the help of example.	5

Q4	Design a class named 'student' having
	
	    private data members: - roll number, name and marks
	    public member functions: -
	        • void getData(); // get student data from user
	        • void displayData(); // display data
	
	Write a 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'.
		10

Q5(a)	Can there be more than one arguments to templates? *Yes or No*. Explain with the help of example.	6
Q5(b)	How does a template work in C++? Also, differentiate between class template and function template with the help of examples.	10

Q6	Write a C++ program having a class *'Student'* that generates a mark-sheet. Mandatory private data members are roll number, name, age, and marks in five subjects. A class may have more private data members. Include all the necessary public member functions. Also, design a user defined exception class to check the following conditions and throw exceptions if the criterion is not met.
	
	    a. Roll number is an integer.
	    b. Age is an integer and should be in between 18 and 23.
	    c. All the five marks must be between 0 – 100.
	The generated mark-sheet should include roll number, name, age, marks in five subjects, total marks, average marks, and grade (average marks >= 90, grade is S; average marks >= 80, grade is A; average marks >= 70, grade is B; average marks >= 60, grade is C; average marks >= 50, grade is D; average marks < 50, grade is F)
		10

Q7(a)	Write a program to open a blank window. The user must be able to close, minimize and maximize it.	6
Q7(b)	Explain the use of this pointer with the help of example in C++.	5
Q8	What is a COM interface? Explain in brief how COM is used in Windows programming?	10