Thapar Institute of Engineering & Technology, Patiala
Computer Science & Engineering Department
Mid Semester Examination (MST)

B. E. (First Year): Sem-II (2019-20) **Course Code:** UTA018 (Object Oriented Programming)

Date: 7-Mar 2020 **Time:** 2 Hours **M.Marks:** 25

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NOTE: Solve problems **IN ORDER,** otherwise they WILL **NOT** be **checked**. If you are not sure about the current question then leave appropriate pages and move on. **New page** for new problem. Plan on the last page before attempting to **avoid cutting**. Draw suitable **diagrams** wherever possible.

1. Procedure oriented programming (POP) such as C-language is not quite efficient to model real world problems. C language was invented in 1972 by Dennis Ritchie in USA. In 1979 *Bjarne Stroustrup* was working on his PhD thesis and liked "Simula 67" language which was primarily used for simulations but was quite slow for practical use. He proposed a language "C with classes" which was renamed to C++ in 1983. This language was the first object-oriented programming (OOP) language.
   What is an object oriented programming (OOP)? Explain *four* fundamental features of OOP. (1, 4)
2. What are the *differences* between structures in C and C++? Write a C++ program using a class containing (i) *one* private integer variable (ii) *two* public functions: setData(..), getData(..) to input and output the integer variable of the object, (iii) main( ) function for object creation and accessing member functions. (2,3)
3. Define constructors and destructors in C++? Write *one* program to explain various types of constructors? (2,3)
4. Inheritance partitions a system architecture into semi-disjoint components that are related hierarchically. What is the advantage of inheritance in C++? Define all types of inheritance with diagram and syntax. (1,4)
5. Polymorphism is derived from Greek word: poly (many) & morphs (forms). Explain the difference between early and late binding in C++? Fill in the blanks below. (2,3)

```
#include<iostream>
using namespace std;
class Base{
public:
_______ void show() = 0;
};
class Derived: _____________{
void show() {cout<<"In derived"<<endl;}
};
int main(){
Base *obj = new _____________;
obj->show();
}
```