JADAVPUR UNIVERSITY ENGINEERING FACULTY
B.COMP.SC.ENGG-SECOND YEAR, SESSION: 2017 - 2018

**Object Oriented Programming using C++**

**Assignment I**

**Submission Deadline:**

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| 1 | Design a class TIME which stores hour, minute and second. The class should have the methods to support the following:<br>• User may give the time value in 24-hour format.<br>• User may give the time value in AM/PM format<br>• Display the time in 24-hour format.<br>• Display the time in AM/PM format.<br>• User may like to add minute with a time value. |
| 2 | Design a COMPLEX class, which will behave like normal integer with respect to<br>• addition,<br>• subtraction,<br>• accepting the value and<br>• displaying the value. |
| 3 | Design a class for the following scenario:<br>• An item list contains item code, name, rate, and quantity for several items.<br>• Whenever a new item is added in the list uniqueness of item code is to be checked.<br>• Time to time rate of the items may change.<br>• Whenever an item is issued or received existence of the item is checked and quantity is updated.<br>• In case of issue, availability of quantity is also to be checked.<br>• User may also like to know price/quantity available for an item |
| 4 | Design a STUDENT class to store roll, name, course, admission date and marks in 5 subjects. Provide methods corresponding to admission date and receiving marks, preparing mark sheet. Support must be there to show the number of students who have taken admission. |
| 5 | Design an ARRAY class with the following features:<br>a) Array object may be declared for a specific size and a value for initializing all the elements. If this it is to be assumed as a 0.<br>b) An array object may be declared and initialized with another object.<br>c) An array object may be declared and initialized with another array (not the object, standard array as in C language).<br>Let a and b are two objects:<br>i. a+b will add corresponding elements.<br>ii. a=b will do the assignment.<br>iii. a[I] will return the ith element of the object.<br>iv. a*5 or 5*a will multiply the element with 5. |
| 6 | Design a STRING class, which will have the initialization facility similar to array class. Provide support for<br>• Assigning one object for another,<br>• Two string can be concatenated using + operator,<br>• Two strings can be compared using the relational operators. |
| 7 | Modify the STRING class so that assigning/initializing a string by another will not copy it physically but will keep a reference count, which will be incremented. Reference value 0 means the space can be released. |

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| 8 | Design a TOLLTAX class to store the number of cars that crossed the bridge and total amount collected. It must support the following activities.<br>• Receiving toll.<br>• Display number of cars that crossed the bridge.<br>• Display the amount of toll collected. |
| 9 | Design a BALANCE class with account number, balance and date of last update. Consider a TRANSACTION class with account number, date of transaction, amount and transaction type. If it is a withdrawal check whether the amount is available or not. Transaction object will make necessary update in the BALANCE class. |
| 10 | In a bank two types of accounts are there savings and current. For savings account a minimum deposit of Rs. 500 are to be kept. In current account overdraft up to Rs. 20,000 is allowed. Each transaction is noted. Design and implement the necessary classes. |