

~~Dr. Anand~~  
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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Sep 2017

B.Tech (CSE/IT) III Semester

COURSE CODE: 10B11CI311

MAX. MARKS: 15

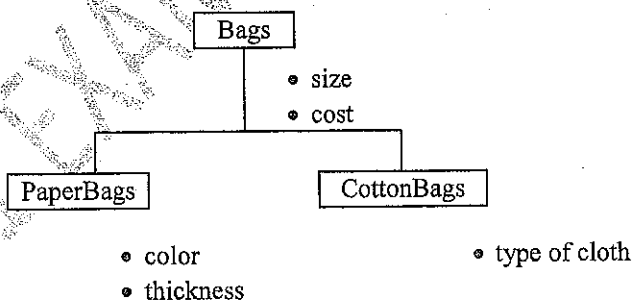
COURSE NAME: OBJECT-ORIENTED PROGRAMMING

COURSE CREDITS: 4

MAX. TIME: One hr

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. Create a class named *StudentGrade*. Include fields for a student *roll number*, *name*, *total marks*, *marks obtained*, and *letter grade*. Create a constructor that requires the student roll number, name, total marks, and marks obtained. If a value for total marks is not passed to the constructor, the total marks value is set to 100 by default. (If a 0 value is passed for total marks, force total marks to 1 so that you do not divide by 0 when calculating a grade). Define a member function that calculates the student's percentage ( $\text{marks obtained}/\text{total marks} \times 100$ ) and assigns a letter grade based on the following: 80% or above (A+), 75–79% (A), 70–74% (B+), 60–69% (B), 50–59% (C+), 40–49% (C), 30–39 (D), less than 30% (F). Create a *main()* function that instantiates and displays enough *StudentGrade* objects to test a variety of scores and possible point values. [4 marks]
2. Design and implement the classes in the following hierarchy using C++. You may add more data members, if needed. You should include overloaded constructors in each class. All classes should have overridden member functions *get\_bag\_info()* and *print\_bag\_info()* that enter and display all the data stored in an object of that class, respectively. You must demonstrate dynamic binding using *get\_bag\_infor()* and *print\_bag\_info()* functions in the *main()*. [4 marks]



3. Create a *PhoneBook* class. Fields include *first name*, *last name*, *area code*, and *phone number*.
  - a) Include insertion and extraction and insertion operators that prompt and display the values of each field, respectively.
  - b) Overload the operator `[]()` function to change a *PhoneBook* object's phone number.
  - c) Overload the operator `()()` function to change the area code and phone number. [4 marks]
4.
  - a) Explain the relationship between inheritance and polymorphism.
  - b) What are static members and static member functions? Explain with the help of an example.
  - c) What is an Inline function? In which situations do we make a function inline? [3 marks]

CT-6, BT