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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program/course: B.Tech (CSE+LLB) Cyber law	**Semester : III**
Subject: OOPs using C++ and UML	**Max. Marks : 100**
Code : CSEG 201	**Duration : 3 Hrs.**
No. of page/s: 4	

SECTION-A
(Attempt all questions)
(5*4=20 marks)

1. Compare early binding and late binding.

2. Choose the correct answer:

i. Which operator is used to insert the data into file?
   a) >>
   b) <<
   c) <
   d) None of the mentioned

ii. Static data members cannot be private.
   a) True
   b) False

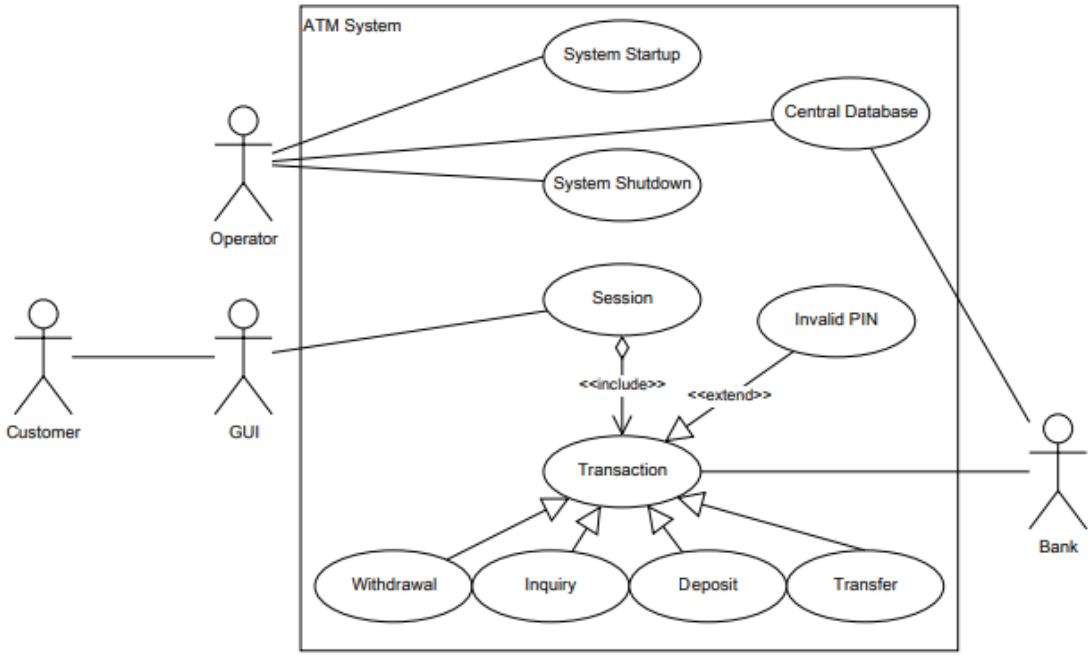
iii. Pick out the correct statement.
   a) A derived class's constructor cannot explicitly invokes its base class's constructor
   b) A derived class's destructor cannot invoke its base class's destructor
   c) A derived class's destructor can invoke its base class's destructor
   d) None of the mentioned

iv. Kind of diagrams which are used to show interactions between series of messages are classified as
   a) Activity diagrams
   b) State chart diagrams
   c) Collaboration diagrams
   d) Object lifeline diagrams

3. Explain inline function with example.

4. What is Exception Handling? Explain with example.

5. **Consider the following use case diagram and answer the following questions:**



i. The relation between Invalid PIN and Transaction does not conform to the UML standard. State **True/False** and give appropriate **reason**.

ii. The use case should clarify in what direction data is transferred to and from the Central Database. State **True/False** and give appropriate **reason**.

iii. The Central Database should be moved outside the ATM System box, but the connections should be kept. State **True/False** and give appropriate **reason**.

iv. The relation between the Customer and the GUI is not permitted in UML use case diagram syntax. State **True/False** and give appropriate **reason**.

SECTION-B
(Attempt all questions)
(4*10=40 marks)

6. Differentiate between multilevel inheritance and multiple inheritance with an example.

7. What is the constructor? List the characteristics of constructor. Write a C++ program to define a suitable parametrise constructor with default values for the class distance having data members feet and inches.

8. What is a friend function? What are the merits and demerits of using a friend function?

9. What is operator overloading? Write a C++ program to explain operator overloading of binary operator.

SECTION-C
(This section has internal choice.)
(2*20=40 marks)

10. a) Write a function in C++ to print the count of word the as an independent word in a text file STORY.TXT. For example, if the content of the file STORY.TXT is
There was a monkey in the zoo. The monkey was very naughty.
Then the output of the program should be 2. [10]

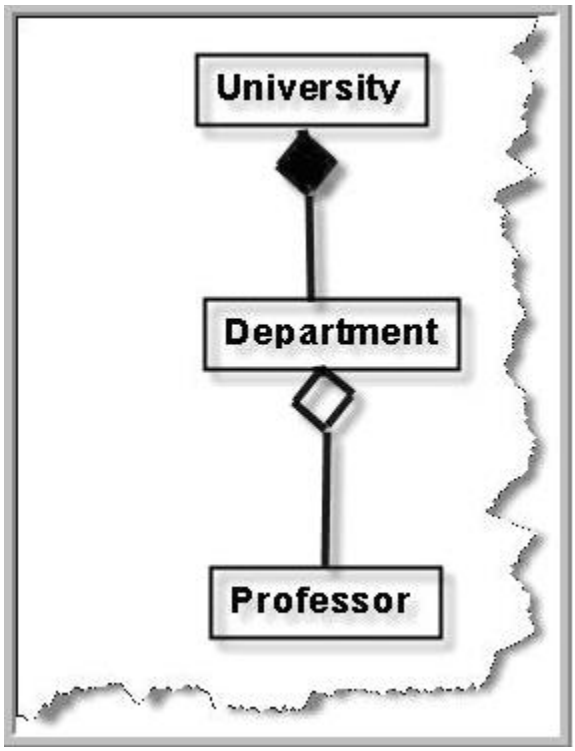
b) Write a function in C++ to count and display the number of lines not starting with alphabet 'A' present in a text file "STORY.TXT".
Example:
If the file "STORY.TXT" contains the following lines:
The rose is red.
A girl is playing there.
There is a playground.
An aeroplane is in the sky.
Numbers are not allowed in the password.
The function should display the output as 3. [10]

OR

11. Write a function in C++ to add 10 records to a file "STUD.DAT", assuming the binary file is containing the objects of the following class. Also write another function that reads these records from the file. [10+10]

```
Class STUD
{
int Rno; char Name[20];
public:
void Enter(){cin>>Rno;gets(Name);}
void Display(){cout<<Rno<<Name<<endl;}
};
```

12. a) Explain the concept of aggregation and composition in class diagrams with reference to the following diagram: [10]



b) We have four objects 'Customer',' Product', 'Stock' and 'Payment'. Show the message flow using **Sequence Diagram** among these objects. It should specify the following:[10]

i. Customer object sends message to the product object to request if the product is available or not.
ii. Product object sends message to the stock object to see if the product exists in the stock.
iii. Stock object answers saying yes or No.
iv. Product object sends the message to the customer object.
v. Customer object then sends a message to the payment object to pay money.
vi. Payment object then answers with a receipt to the customer object.
One of the points to be noted is product and stock object is not active when the payment activity occurs.

OR

13. a) Explain the OMT Methodology in detail. [10]
b) You are supposed to model the following situation using State Diagram: [10]
i. A home delivery service has the two states wait and deliver.
ii. At the beginning, wait is active.
iii. As soon as a customer has ordered a product, a transition to deliver takes place.
iv. During the transition, the order is processed.
v. deliver state stays active until the product has been delivered to the customer, then a transition to wait happens.

……..ALL THE BEST!!!!.....

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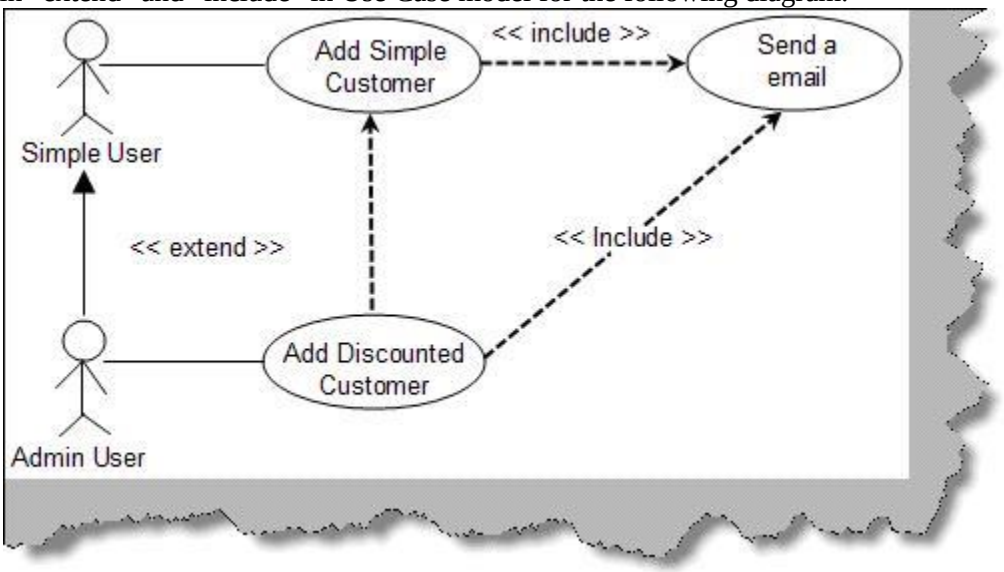
SECTION-A
(Attempt all questions)
(5*4=20 marks)

1. List the characteristics of a friend function.
2. Define exception handling. Explain the use of try, catch and throw for exception handling in C++ with example.
3. Define pure virtual functions. Write a C++ program to illustrate pure virtual functions.
4. Explain "extend" and "include" in Use Case model for the following diagram:



5. Choose the correct answer:
   i.
```
#include <iostream>
using namespace std;
void print(int i)
{
   cout << i;
}
void print(double  f)
{
   cout << f;
}
```

```
int main(void)
{
   print(5);
   print(500.263);
   return 0;
}
```

a) 5 500.263
b) 500.263 5
c) 500.263
d) none of the mentioned

ii.
```
#include <iostream>
using namespace std;
int main()
{
   int a = 5, b = 10, c = 15;
   int *arr[ ] = {&a, &b, &c};
   cout << arr[1];
   return 0;
}
```

a) 5
b) 10
c) 15
d) it will return some random number

iii.
```
#include <iostream>
using namespace std;
int main ()
{
   char first, second;
   cout << "Enter a word: ";
   first = cin.get();
   cin.sync();
   second = cin.get();
   cout << first << endl;
   cout << second << endl;
   return 0;
}
```

a) first
b) second
c) Returns first 2 letter or number from the entered word
d) None of the mentioned

iv. Aggregation is which of the following?
a) Expresses a part-of relationship and is a stronger form of an association relationship.
b) Expresses a part-of relationship and is a weaker form of an association relationship.
c) Expresses an is-a relationship and is a stronger form of an association relationship.
d) Expresses an is-a relationship and is a weaker form of an association relationship.

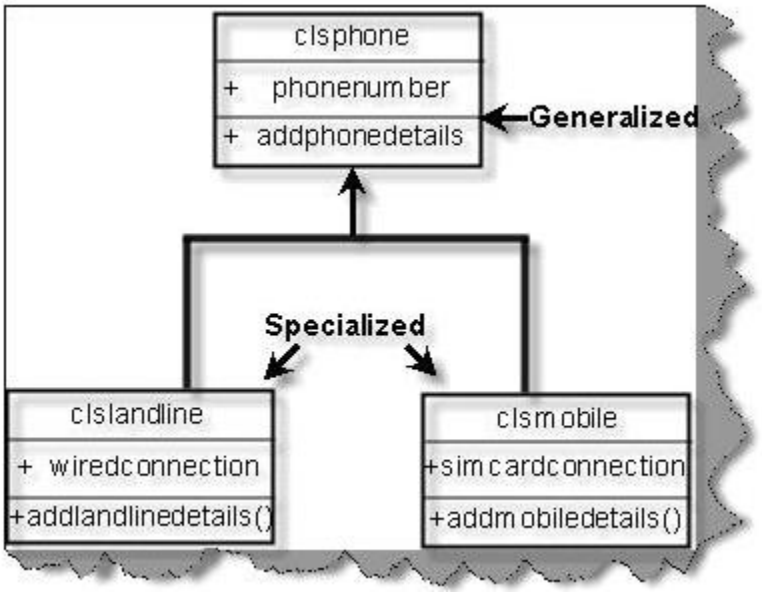
SECTION-B

(Attempt all questions)
(4*10=40 marks)

6. List the type of inheritances with examples and write a program to implement single inheritance with public access specifier.
7. What are static data members? Differentiate between static data member and static member function.
8. Define pure virtual functions. Write a C++ program to illustrate pure virtual functions.
9. What is the constructor? List the characteristics of constructor. Write a C++ program to define a suitable parametrise constructor with default values for the class distance having data members feet and inches.

SECTION-C
(This section has internal choice)
(2*20=40 marks)

10. a) Explain the concept of generalization and specialization in class diagrams with reference to following: [10]



b) How is structured analysis and structured design different from OO Analysis and OO Design. Explain. [10]

OR

11. a) How do you model the following situation with a UML use case diagram: [10]
    i. A teacher is conducting an interview with a student. In the course of that, the teacher always has to grade the student.
    ii. A mother cooks dinner together with her daughter. In the course of that, the mother also always has to mix the cocktails.

    b) What is UML? What are the benefits of UML for system designers? Explain any two types of UML diagrams. [10]
12. a) Write a C++ program, which initializes a string variable to the content "Time is a great teacher but unfortunately it kills all its pupils. Berlioz" and outputs the string to the disk file OUT.TXT. [5]

b) Write a user-defined function in C++ to read the content from a text file OUT.TXT, count and display the number of alphabets present in it. [5]
c) Write a function to count the number of blank present in a text file named "OUT.TXT". [5]
d) Write a function to count number of words in a text file named "OUT.TXT". [5]

OR

13. Assuming the class DRINKS defined below, write functions in C++ to perform the following:
(i)Write the objects of DRINKS to a binary file. [10]
(ii) Read the objects of DRINKS from binary file and display them onscreen when DNAME has value "INDY COLA". [10]

```
class DRINKS
{
int DCODE; char DNAME[13]; //Name of the drink
int DSIZE; //Size in liters
float DPRICE;
public:
void getdrinks( ){cin>>DCODE>>DNAME>>DSIZE>>DPRICE;}
void showdrinks( ) {cout<<DCODE<<DNAME<<DSIZE<<DPRICE<<endl;}
char *getname( ){return DNAME;}
};
```

……..ALL THE BEST!!!!.....