Offline End-Sem Examination (BTech 2024, CS / IT / CSAI / CSB)
Object Oriented Programming & System Design (OOP2301C)

23-May-25, Friday, 10:00am - 1:00pm (Bibek Singh)

Total Questions: 10 (ten) **Total Marks: 100 (hundred)**

Question-1: (5+10 marks)

(a) Explain the difference between synchronous and asynchronous exceptions.
(b) Why do we need an exception handling model? Describe its implementation.

Question-2: (5+10 marks)

(a) Explain 'Lazy Initialization'. What is the impact of not using it in our code?
(b) When do we use Singleton Pattern? What are its key implementation points?

Question-3: (5+5 marks)

(a) What do you understand by Polymorphism? Give an example.
(b) What is a Constructor and how is it used? Explain different types.

Question-4: (10 marks)

Explain MVC design pattern. How can we use it in an Order Management System?

Question-5: (10 marks)

Explain **any 2** design patterns out of the following –: Flyweight, Memento, State, Template, Chain of Responsibility, Adaptor or Abstract Factory.

Question-6: (5+5 marks)

(a) Why do we need Interfaces?
(b) Compare Interfaces with Abstract Classes. Write at least 3 differences.

********** P.T.O. **********

Question-7: **(10 marks)**

Explain SOLID principles.

Question-8: **(5 marks)**

Demonstrate your understanding of encapsulation by defining a class with the following specifications:

Class name: Bank

Member variables:
double p // stores the principal amount
double t // stores the time period in years
double r // stores the rate of interest
double a // stores the amount

Member methods:
void accept () // input values for p and n.
void calculate () // calculate the amount using a= p+p*t*r/100

Question-9: **(10 marks)**

Explain the Observer design pattern.

Question-10: **(5 marks)**

What are the advantages of using a Facade design pattern?

********** End of the Paper **********