C10-R4: SOFTWARE SYSTEMS

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours **Total Marks: 100**

1.

a) Discuss how can software quality be achieved during software development.

b) What is preliminary investigation? Who does it? What is the purpose of preliminary investigation?

c) What is the difference between the system life cycle and a system development methodology?

d) Explain characteristics of an Object Oriented System.

e) Explain: Use case and Scenario. Discuss how Use-Case diagram can be used to model the requirements of a system.

f) Give the characteristics of the design phase.

g) List all kinds of control information represented by Dynamic model.

(7x4)

2.

a) In what situations waterfall model will be used? Justify your answer. Name the risk based software development process model? What are its advantages and disadvantages?

b) What do you mean by requirements engineering? Explain the steps of RE process? Why should a requirement engineer avoid making any design decision during requirement analysis?

c) Prepare Dynamic Model (State Chart Diagram) for the Order Processing system.

(6+6+6)

3.

a) Prepare Data Flow Diagram and E-R Diagram for Library Management System. (Give the problem statement and define the scope).

b) What is a data dictionary? What is the importance of it? What are the contents of a Data Dictionary?

c) Reusability is an important feature of Object Oriented System. What are the good practices to be adopted while designing for reuse?

(8+6+4)

4.

a) Explain how does object oriented design provide separation of interface and implementation. What is the main element/purpose of class diagram? How to identify classes and objects that are relevant to a particular object?

b) When are Interaction Diagrams used? Differentiate between Sequence Diagram and Collaboration Diagram.

c) *Use Cases* should be written in terms of Actors and Roles. Define these terms. How many roles can a single person have? Discuss the object oriented software development process using *use case* method.

(6+6+6)

5.

a) Differentiate between Requirements workflow v/s Analysis workflow. How to identify classes from a system?

b) Why are object oriented programming techniques required? List out the different types of UML Diagrams. Explain in detail the UML diagrams that represent only the dynamic aspects of the software system, with example.

c) Define object model. Explain the various elements of object model in detail. Why software is inherently complex? Briefly explain the structure of complex systems.

(4+8+6)

6.

a) How would you differentiate good design from a bad design?

b) What is the difference between architecture and a framework? What roles can architectures play in the development of software systems?

c) What is the aim of testing? Which are the methodologies (techniques) of testing? How Use-Cases and Testing are related?

(4+6+8)

7.

a) How is a Object Oriented Software (System) tested? Differentiate between Test Case and Test Suite. How to prepare the test case?

b) Compare agent oriented software development and object oriented software development by discussing various advantages and disadvantages. What do you understand by a multi agent system?

c) What is a component? What are the different types of components? Differentiate between components and classes.

(6+6+6)