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) Define software engineering and software reliability.
b) How quantitative project can contribute to project planning?
c) What do you mean by reverse engineering?
d) List the reasons for the Failure of Water Fall Model.
e) Define data dictionary. What are the contents of data dictionary?
f) List the factors of Software Quality.
g) What are the Generic Framework Activities?

(7x4)

2.

a) What are the different artifacts referred while writing the test cases? What is the difference between a Test Plan and a Use Case?
b) Explain how both waterfall model and prototyping model can be accommodated in the spiral process model.
c) What are the drawbacks of spiral model?

(6+6+6)

3.

a) Explain the steps involved in the software prototyping.
b) What are the functional and non-functional requirements of Hotel Management System?
c) Differentiate between Architectural Design and Data Design. How the Architectural Design can be represented? What are the outputs of Architectural Design?

(6+6+6)

4.

a) What are the testing principles the software engineer must apply while performing the software testing?
b) Distinguish between Alpha and Beta testing.
c) What do you mean by software quality assurance (SQA)? What are the components of SQA plan? Mention the goals of SQA group.

(5+6+7)

5.

a) List the purposes of Data Flow diagrams and Entity-Relationship diagrams?
b) Why should you develop both logical and physical DFDs for systems? What advantage is there for drawing a logical DFD before a physical DFD for a new information system?
c) Using the example of a retail clothing store in a mall, list relevant data flows, data stores, processes, and sources/sinks. Observe several sales transactions. Draw a context diagram and a level-0 diagram that represent the selling system at the store. Explain why you chose certain elements as processes versus sources/sinks.

(4+4+10)

6.

a) In Library Management System (LMS), each physical library item - book, tape cassette, CD, DVD, etc. could have its own item number. To support it, the items may be barcoded. The purpose of barcoding is to provide a unique and scannable identifier that links the barcoded physical item to the electronic record in the catalogue. Barcode must be physically attached to the item, and barcode number is entered into the corresponding field in the electronic item record.Barcodes on library items could be replaced by RFID tags. The RFID tag can contain item's identifier, title, material type, etc. It is read by an RFID reader, without the need to open a book cover or CD/DVD case to scan it with barcode reader.

Draw UML class diagram for the library management system. Depict all the classes, relationships, cardinality in the diagram.

b) How Sequence diagram is different from Collaboration diagram?

c) Compare Deployment diagram and Component diagram. Mention their similarities and differences.

(10+4+4)

7.

a) Define software architecture. Explain the different architectural styles.

b) Discuss the importance of software architecture.

c) How contexts affect the software architecture?

(8+5+5)