

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) What are the characteristics that make software different from hardware? Show how the failure curve of software differs from that of hardware.
 - b) Is it true that whenever cohesion of different modules in the design is increased, coupling among the modules automatically decreased? Justify the statement.
 - c) Why the Spiral life cycle model is considered to be a Meta model? What are the advantages of using evolutionary process model?
 - d) Develop a set of use cases for the ATM system
 - e) "Quality, Reliability, Security and Safety are related concepts, but fundamentally different in a number of ways." Discuss.
 - f) Why SRS (Software Requirements Specifications) document is also known as black box specification of a system?
 - g) Explain the principles of Software Design (Architecture, Module, User interface etc.).

(7x4)

2.
 - a) Under which circumstances is it beneficial to construct a Prototype? Does construction of Prototype always increase the overall cost of software development?
 - b) Discuss the relationship between the concept of information hiding as an attribute of effective modularity and the concept of module independence. Why is it good idea to keep the scope of effect of a module within its scope of control?
 - c) Explain different steps of requirements engineering process. Discuss any two requirements elicitation techniques.

(6+6+6)

3.
 - a) What are the two primary goals of Testing? Which are the attributes, which will impact the Testing Process? What do you mean by Test case? How to measure the effectiveness and efficiency of it?
 - b) Explain the manner in which use cases can be used for the purpose of the testing.
 - c) Justify the design principle: "The code should be open for extensions, but closed for modifications".

(8+6+4)

4.
 - a) What kinds of role UML plays in terms of defining and designing software architectures? What are the roles of software architect? How to achieve dynamism in software architectures?
 - b) Compare and contrast between Activity diagram and State-chart diagram.
 - c) Discuss the following
 - i) State and Activity
 - ii) Use Case and Collaboration

(6+6+6)

5.

- a) Define Design Pattern. Differentiate between Pattern, Framework and Architecture.
- b) For the Social Networking site of your choice, prepare the following models by describing the system with the problem statement.
 - i) Draw the sequence diagram.
 - ii) Draw the activity diagram.
- c) Define object model. Explain the various elements of object model in details. 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? What does a concept in an Object Oriented design refer to?
- b) Draw a data flow diagram and ER diagram for a banking system.
- c) Explain how object oriented design provides separation of interface and implementation. What are the good practices to use while designing for reuse? How Agent Oriented Software Development differs from Object Oriented Software Development?

(4+6+8)

7.

- a) What are the main elements and purpose of use cases (diagram) and class diagram? How to convert use cases into class diagram?
- b) Explain Architectural Design. What do you mean by modularity and layered architecture in terms of Software Design?
- c) What would be the test objective for Unit Testing and System Testing? What are the quality measurements to assure that Unit Testing and System Testing are complete?

(6+6+6)