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Question Paper Code : 21509

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fourth Semester

Information Technology

IT 2251/IT 41/IT 1251 A/10144 IT 406/080250013 — SOFTWARE ENGINEERING AND QUALITY ASSURANCE

(Regulation 2008/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the human and organizational factors from the system's environment that affect the system design.

2. Distinguish between spiral model from winwin spiral model.

3. List four non functional requirements in developing a software for Library Systems that support for cataloguing new documents.

4. What is a data dictionary? State its significance.

5. List the major user interface design principles.

6. How does the system design of a Real Time system work? Illustrate with a neat sketch.

7. State the significance of interface testing even when individual components have been extensively validated through component testing and unit testing.

8. What are the key differences between validation testing goals and acceptance testing goals?

9. What suggestions were given by Humphrey for a quality plan?

10. Name four static software product metrics and their purpose.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Elaborate on the six elements of computer based systems. (6)

    (ii) Explain the goals of business process engineering and product engineering. (10)

Or

(b) Describe the activities for a generic system modeling process. Illustrate with an example. (16)

12. (a) (i) Distinguish between functional and non functional requirements. State and explain the types of non functional requirements with a neat sketch. (8)

    (ii) Design a use case diagram for developing a software for library management system. (8)

Or

(b) (i) What are the advantages and disadvantages of building separate functional and behavioral models? What representations are used for each of these models? Explain the need for structural analysis. (10)

    (ii) Explain the viewpoints with illustrations. (6)

13. (a) A flood-warning system is to be procured which will give early warning of possible flood dangers to sites that are threatened by floods. The system will include a set of sensors to monitor the rate of change of river levels, links to a meteorological system giving weather forecasts, links to the communication systems of emergency services (police, coast guard, etc.), video monitors installed at selected locations, and a control room equipped with operator consoles and video monitors.

Controllers can access database information and switch video displays. The system database includes information about the sensors, the location of sites at risk and the threat conditions for these sites (e.g., high tide, south-westerly Winds), tide tables for coastal sites, the inventory and location of flood-control equipment, contact details for emergency services, local radio stations etc.

Draw a block diagram of a possible architecture for such a system. You should identify the principal subsystems and the links between them. (16)

Or

(b) (i) What are the major design issues in User Interface Design? Explain with neat sketches wherever necessary. (10)

    (ii) Explain why a software system that is used in a real-world environment must change or become Progressively less useful. (6)

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14. (a) Explain four major testing techniques used in the black box testing. Give an example for each (16)

Or

(b) (i) State the importance of defining a test case for each requirements. What are the two primary benefits of defining this test case? (6)

(ii) Distinguish between validation and verification. Explain the process which is difficult to perform. (10)

15. (a) (i) Discuss in detail the various issues in quality assurance and standards. (10)

(ii) Describe the details of quality planning and quality control. (6)

Or

(b) (i) Distinguish between PMM and CMM. State the significance of moving up in the top level CMM for the organizations. (8)

(ii) Elaborate on Software configuration management. (8)

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