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B.Tech. VI SEMESTER

Principles of Software Engineering (CE-302-C)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART–A

1. (a) What are the advantages of developing a prototype of a system? (1.5)

(b) Differentiate between functional and non functional requirements. (1.5)

(c) Define Coupling and Cohesion. (1.5)

(d) List the important properties of a modular system. (1.5)

(e) What are software metrics? What is the significance of software metrics? (1.5)

(f) Differentiate between Quality and reliability. (1.5)

(g) What are the advantages of static testing as compared dynamic testing? (1.5)

(h) What do you mean by a software process? What is the difference between methodology and a process? Explain with suitable examples. (1.5)

(i) Annual Change Traffic (ACT) for a software system is 15% per year. The development effort is 600 PMs. Compute an estimate for Annual Maintenance Effort (AME).If the life time of the project is 10 years, what is the total effort of the project. (1.5)

(j) Define Software Engineering. Discuss any two software myths. (1.5)

PART–B

2. (a) Discuss the Spiral Model of software development process. Which of the development process model you will follow for the following and why:

(i) A simple data processing project.

(ii) A data entry system for the office who never used computer before.

(iii) A spreadsheet system with basic features and other features that use basic features.

(iv) A new missile tracking system.

(v) A payroll software. (10)

(b) What do you understand by "requirements elicitation"? Discuss any two techniques of requirement elicitation in detail. (5)

3. (a) Software has to be developed for automating the University result system. Draw use case diagram explaining all actors and flow of events. (5)

(b) Consider a project to develop a full screen editor. The major components identified are (1) Screen edit (2) Command language interpreter (3) File input and output (4) Cursor movement and (5) Screen movement. The sizes for these are estimated to be 4K, 2K, 1K, 2K and 3K delivered source code lines. Use COCOMO model to determine:

(i) Overall cost and schedule estimates (assume values for different cost drivers, with at least three of them being different from 1.0)

(ii) Cost and Schedule estimates for different phases. (10)

4. (a) Consider a project with the following parameters.

(i) External Inputs: 10 with low Complexity, 15 with Average and 17 with high Complexity.

(ii) External Outputs: 06 with low Complexity and 13 with high Complexity.

(iii) External Inquires: 03 with low Complexity, 04 with Average and 02 with high Complexity.

(iv) Internal logical files: 02 with Average and 01 with high Complexity.

(v) External Interface files: 09 with low Complexity.

In addition to the above, system requires (i) Significant Data Communication (ii) Performance is very critical (iii) Designed code may be moderately reusable (iv) System is not designed for multiple installations in different organizations. Other complexity adjustment factors are treated as average. Compute the function point for the same. (10)

(b) What are various categories of software metrics? Discuss with the help of examples. (5)

5. (a) Define Software Quality? Explain in detail the ISO 9126 Quality model. (5)

(b) Explain CMM in detail. Also discuss various key process areas (KPA's) at various maturity levels. (10)

6. (a) Discuss the objectives of modular software design. What are the effects of module coupling and cohesion? (5)

(b) What is the need for Software configuration management? Discuss in detail various configuration management functions and activities. (10)

7. Write short notes on any *three* of the following :

(a) Design Principles.

(b) Software Re-engineering.

(c) CASE tools.

(d) Function Point.

(e) Clean Room Engineering. (15)