

AMIETE – CS/IT (OLD SCHEME)

Time: 3 Hours

OCTOBER 2012

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

- a. _____ describes the order of tasks and estimates of time and effort attributes.
- (A) Test plan (B) Quality assurance
(C) Requirements (D) Project schedule
- b. Project risk factor is considered in
- (A) Waterfall model (B) Prototyping model
(C) Spiral model (D) Interactive enhancement model
- c. Spiral model is an example of
- (A) Evolutionary development model
(B) Prototype model
(C) Linear sequential model
(D) RAD model
- d. In requirement engineering, the term QFD stands for
- (A) Quality function design (B) Quality factor design
(C) Quality function deployment (D) Quality function development
- e. Number of user inputs, user outputs and user inquiries are used as metrics to compute
- (A) line of count (B) program logic
(C) function point (D) structure point

- f. Which of the following is not a product attribute of an intermediate COCOMO model?
- (A) Data size (DATA)
 (B) Virtual machine volatility (VIRT)
 (C) Product complexity (CPLX)
 (D) Required software reliability (RELY)
- g. When a module contains tasks that are related by the fact that all must be executed with the same span of time, then the module exhibits _____
- (A) Cohesion
 (B) Logical Cohesion
 (C) Temporal Cohesion
 (D) Coincidental Cohesion 2
- h. In basic execution model, the additional time required to reach the failure intensity objective is given by
- (A) $\Delta\tau = \frac{V_0}{\lambda_0} \ln\left(\frac{\lambda_P}{\lambda_F}\right)$
 (B) $\Delta\tau = \frac{V_0}{\lambda_0} \ln\left(\frac{\lambda_F}{\lambda_P}\right)$
 (C) $\Delta\tau = \frac{\lambda_0}{V_0} \ln\left(\frac{\lambda_P}{\lambda_F}\right)$
 (D) $\Delta\tau = \frac{\lambda_0}{V_0} \ln\left(\frac{\lambda_F}{\lambda_P}\right)$
- i. Cyclomatic Complexity is used for _____.
 (A) Test analysis
 (B) Test planning and test case design
 (C) Test documentation
 (D) Test maintenance
- j. Boehm's model is suited for _____.
 (A) Analysis
 (B) Development
 (C) Maintenance
 (D) Modification

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

- Q.2** a. Explain various capability maturity models. (5)
- b. What are the strengths and weaknesses of interactive enhancement model over waterfall model and prototype model? (5)
- c. Write short notes on each of the followings: (6)
- (i) Design Walkthroughs
 (ii) Critical Design Review

- Q.3** a. Explain crucial process steps in requirement engineering. (5)
- b. Using suitable examples explain how followings are used in problem analysis of software requirement analysis:
- (i) Data Flow diagram
- (ii) E – R diagram (6)
- c. Explain the importance of requirement reviews in validation process of SRS. (5)
- Q.4** a. Describe the following software size metrics:
- (i) Lines of Code (LOC)
- (ii) Function Count (5)
- b. Compare the functioning of basic information flow model and sophisticated information flow model. (6)
- c. Compute the function point value for a project with the following information domain characteristics:
 Number of user inputs = 15, Number of user outputs = 13, Number of user enquiries = 25, Number of files = 12, Number of external interfaces = 4.
 Assume that all complexity adjustment values and weighting factors (Z_{ij}) are set to average value = 3. Assume that 14 algorithms have been counted. (5)
- Q.5** a. Explain the uncertainties in cost estimation models. (4)
- b. Explain the functioning of detailed COCOMO model. (6)
- c. Write short notes for the following in Putnam Resource Allocation model:
- (i) Productivity versus difficulty
- (ii) Trade-off between time and cost (6)
- Q.6** a. Explain the various types of module cohesions and give their respective order of priorities. (6)
- b. Give an example to illustrate bottom-up design, top-down design and hybrid design. (5)
- c. Explain the features of object oriented design. (5)
- Q.7** a. Explain software reliability versus hardware reliability. (4)
- b. Compare the following reliability models:
- (i) Logarithmic Poisson Model
- (ii) Calendar Time component
- (iii) Macro Model (9)

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- c. Draw the graphical plot to illustrate the relation between failure intensity function and mean value function. (3)
- Q.8** a. Compare functional and structural testing using suitable example. (6)
- b. Explain any three types of debugging approaches. Give their advantages and disadvantages. (6)
- c. Explain any ONE of the following dynamic testing tools:
- (i) Test File & Test Data Generators
- (ii) Test Harness & Test Archiving systems (4)
- Q.9** a. Discuss the problems faced during maintenance of a software. (6)
- b. A Software project Development Effort of 800 PM (SDE). It is assumed that 10% code will be modified per year (annual change traffic (ACT)). The cost multipliers are given as:
 RELY=1.15, ACAP=0.86, AEXP=0.82, LEXP=0.95, DATA=1.08.
 Calculate the annual maintenance effort (AME). (5)
- c. Explain features of dynamic modeling and functional modeling in object oriented software design. (5)