

**AMIETE – CS/IT (OLD SCHEME)**

Time: 3 Hours

**JUNE 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. Alpha testing is done by
- |               |                   |
|---------------|-------------------|
| (A) Developer | (B) Tester        |
| (C) Customer  | (D) All the above |
- b. Management of software development depends on
- |                        |             |
|------------------------|-------------|
| (A) People             | (B) Process |
| (C) People and process | (D) Product |
- c. Statistically maximum percentage of errors belong to the following phase of SDLC
- |                    |             |
|--------------------|-------------|
| (A) Specifications | (B) Coding  |
| (C) Design         | (D) Testing |
- d. Level-0 DFD is similar to the process of transforming a model into source code is
- |                      |                     |
|----------------------|---------------------|
| (A) Activity diagram | (B) Context diagram |
| (C) System diagram   | (D) State diagram   |
- e. The following is not a feature of process metrics
- |            |                       |
|------------|-----------------------|
| (A) Effort | (B) Cost and schedule |
| (C) Time   | (D) Number of defects |
- f. Phase sensitive effort multipliers and three level product hierarchy are used in
- |                           |                           |
|---------------------------|---------------------------|
| (A) Putnam resource model | (B) Risk assessment model |
| (C) COCOMO model          | (D) Multivariable model   |

g. Elimination of irrelevant data and function definition is

- (A) Encapsulation (B) Hiding  
(C) Secrecy (D) Abstraction

h. In basic execution model, failure intensity is given by

- (A)  $\lambda(\mu) = \lambda_0 \left(1 - \frac{\mu}{V_0}\right)$  (B)  $\lambda(\mu) = \lambda_0 \left(1 - \frac{\mu^2}{V_0}\right)$   
(C)  $\lambda(\mu) = \lambda_0 \left(1 - \frac{V_0^2}{\mu}\right)$  (D)  $\lambda(\mu) = \lambda_0 \left(1 - \frac{V_0}{\mu}\right)$

i. A function of  $n$  variable in robust testing for boundary value analysis yields:

- (A)  $6n + n$  (B)  $6n + 1$   
(C)  $6n * 1$  (D)  $6n * n$

j. Adaptive maintenance is related to modification in software due to

- (A) Increase in complexity  
(B) Demand of new functionalities  
(C) Failures  
(D) Changes to match the working environment

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

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**Q.2** a. Explain Managed and Optimized CMM Levels. (5)

b. Compare the following software life cycle models – iterative enhancement model and spiral model. Give their respective applications. (5)

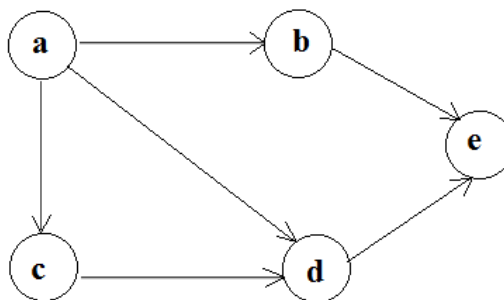
c. Mention various components of software. Explain features of a software process. (6)

**Q.3** a. Explain requirement reviews and automated cross referencing in validation phase of SRS. (6)

b. Consider railway reservation system. Give the detail SRS. Draw E-R diagrams and data flow diagrams. Give its object oriented analysis. (10)

**Q.4** a. Explain the following. Also give various types of each:  
(i) Module Coupling (ii) Module Cohesion (7)

- b. Compare top-down, bottom-up and hybrid design models. (5)
- c. Mention any two features of each of the following verification techniques:  
 (i) Consistency checkers (ii) Critical Design Review (4)
- Q.5** a. Explain basic information flow model and sophisticated information flow model. Give their respective FAN IN and FAN OUT equations. (4+2)
- b. Define the following terms and give their respective equations:  
 (i) Program Length (ii) Program Volume  
 (iii) Program Effort (6)
- c. Explain the features of data structure metrics. (4)
- Q.6** a. Draw the flow of risk management activities. Explain the functionality of each component. (5)
- b. Compare basic, intermediate and detailed COCOMO models. (6)
- c. Consider a large scale project for which the manpower requirement  $K$  is 1000 PY and the development time is 4 year 9 months. Calculate the following:  
 (i) Peak manning  
 (ii) Manpower cost after 2 year 6 months (5)
- Q.7** a. Explain the relationship between software reliability and failure intensity. (4)
- b. Explain the following reliability models and give their respective equations:  
 (i) Logarithmic Poisson Model (ii) Macro Model (6)
- c. Assume a program experience 150 failures in infinite time. The expected failure now is 72. The initial failure intensity was 20 failures/CPU hr. Determine the value of current failure intensity. Find the execution time between present failure intensity of 4.9 failures/CPU hr and an objective of 0.007 failures /CPU hr. (6)
- Q.8** a. Compare decision table based testing and equivalence class testing. (6)
- b. Define cyclomatic complexity. (1+3)



**Code: AC16/AT13****Subject: SOFTWARE ENGINEERING**

Consider the above graph and calculate the cyclomatic complexity by:

- (i) McCabe's equation
- (ii) Predicate method
- (iii) Region method

c. Explain any three debugging techniques. Give their respective features, advantages and disadvantages. **(6)**

**Q.9** a. Compare the following categories of software maintenance techniques:

- (i) Corrective maintenance
- (ii) Adaptive maintenance
- (iii) Perfective maintenance

**(6)**

b. Explain Boehm's software maintenance model and give its applications. **(5)**

c. Explain the features of function oriented software design. **(5)**