Code: AC63/AT63   **Subject: SOFTWARE ENGINEERING**

AMIETE – CS/IT (NEW SCHEME)

Time: 3 Hours   **DECEMBER 2011**   Max. Marks: 100

NOTE: There are 9 Questions in all.
• **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
• **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. During project scheduling, resource allocation to different activities is done using which of the following representations?

(A) PERT chart   (B) activity network representation
(C) work breakdown structure   (D) Gantt chart

b. Statistical testing is based on first determining

(A) operation profile   (B) user profile
(C) product profile   (D) development process profile

c. In which level of SEI Capability Maturity Model both product and process metrics are defined?

(A) initial level   (B) defined level
(C) repeatable level   (D) optimizing level

d. Schedule slippage is a type of

(A) business risk.   (B) project risk
(C) technical risk   (D) none of the above.

e. A project estimation technique based on making an educated guess of the project parameters (such as project size, effort required to develop the software, project duration, cost etc.) is

(A) analytical estimation technique   (B) heuristic estimation technique
(C) empirical estimation technique   (D) none of the above

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f. The term "iconic interface" is applicable to

   (A) command language-based interface.
   (B) menu-based interface.
   (C) direct manipulation interface.
   (D) none of the above.

g. Which of the following view captured by UML diagrams can be considered as black box model of a system?

   (A) structural view   **(B)** behavioral view
   (C) user's view   **(D)** implementation view

h. During structured design, if all the data flow into the diagram are processed in similar ways i.e. if all the input data are incident on the same bubble in the DFD, the one have to use:

   (A) transform analysis
   (B) transaction analysis.
   (C) combination of transform and transaction analysis
   (D) neither transform nor transaction analysis

i. Examples of executable specifications are

   (A) Third generation languages   **(B)** Fourth generation languages
   (C) Second-generation languages   **(D)** First generation languages

j. Among all the phases of software life cycle, which phase consumes the maximum effort?

   (A) Design   **(B)** Maintenance
   (C) Testing   **(D)** Coding

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

Q.2 a. Software project planning entails what activities? Explain.   **(6)**

      b. What is software risk? Describe the process of risk management.   **(6)**

      c. Write a brief note on CASE.   **(4)**

Q.3 a. Write and explain important properties of a good software requirement document.   **(6)**

      b. Show and explain requirements engineering process with the help of a suitable diagram.   **(4)**

c. What are 'context models'? Show context of an ATM system with the help of a suitable diagram.   **(6)**

Q.4 a. Differentiate between evolutionary and throw-away prototyping.   **(4)**

   b. Write a brief note on the following:
      (i)   Formal specification
      (ii) Behavioural specification
      (iii) Interface specification.   **(12)**

Q.5 a. Discuss advantages and disadvantages of client-server software products. **(6)**

   b. Write a brief note on Inter-ORB communications.   **(4)**

   c. What do you mean by domain-specific architecture? Differentiate between two categories domain-specific models- Generic models and reference models. Give an example from each category.   **(6)**

Q.6 a. Define the term cohesion in the context of object-oriented design.   **(6)**

   b. What do you mean by generator-based reuse of software?   **(4)**

   c. What do you mean by frameworks? Define various framework classes.   **(6)**

Q.7 a. Explain UI design process using a suitable diagram.   **(6)**

   b. What do you mean by dependability? What are various dimensions to dependability? Define.   **(5)**

   c. What do you mean by the terms 'fault avoidance' and 'fault tolerance'? Define various fault tolerance actions.   **(5)**

Q.8 a. Assume that the size of an organic type software product has been estimated to be 32,000 lines of source code. Assume that the average salary of software engineers be Rs. 15,000/- per month. Determine the effort required to develop the software product and the nominal development time.   **(5)**

   b. Write down the necessary tasks performed by a project manager in order to perform project scheduling.   **(5)**

   c. Explain Equivalence Class Partitioning and Boundary value analysis. Compare the two.   **(6)**

Q.9 a. Define the following software product metric
      (i)   Fan-in/Fan-out   (ii) Length of code
      (iii) Depth of conditional nesting   (iv) Fog index   **(8)**

   b. Differentiate between version, variant and release. Explain in brief three basic techniques for component identification.   **(8)**