Subject: SOFTWARE ENGINEERING

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

DECEMBER 2009

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.**
- **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. Which of the following testing methods is white-box testing?

   (A) Equivalence partitioning   **(B)** Boundary value analysis
   (C) Basis path testing   **(D)** All of the above

b. In object-oriented, polymorphism means

   (A) There can be many objects in the design
   (B) Methods can be changed in many ways
   (C) Many objects of a class can be instantiated
   (D) Object can implement the same method in many ways

 c. Which of the following is not an activity in the process of developing a formal specification of a sub-system interface?

   (A) Specification naming   **(B)** Specification structuring
   (C) Specification monitoring   **(D)** Operation selection

d. Which of the following is not used in the context flow diagram?

   (A) Shaded corner square   **(B)** Funnel
   (C) Arrow   **(D)** Rectangle with rounded corners

e. Which of the following is not a likely cause for project failure?

   (A) An unrealistic project schedule
   (B) Management not allowing team to access outside expertise when needed
   (C) An unsupportive political climate within the system project environment
   (D) Team norms that facilitate team functioning

f. Which of the following is not a usability attribute?

   (A) Recoverability   **(B)** Adaptability
   (C) Integrity   **(D)** Robustness

g. The fundamental activity common to all software processes is

   (A) Software specification   **(B)** Software evolution
   (C) Software validation   **(D)** All of the above

h. Identify the correct order of the testing process

(A) Unit testing, Module testing, Systems testing, Acceptance testing
(B) Module testing, Unit testing, Systems testing, Acceptance testing
(C) Unit testing, Systems testing, Module testing, Acceptance testing
(D) Unit testing, Module testing, Acceptance testing Systems testing

i. Class of requirement not volatile in nature is

   (A) Mutable requirements   **(B)** Consequential requirements
   (C) Compatibility requirements   **(D)** Application domain requirements

j. Algorithmic cost estimate for software cost can be expressed as

   (A) $Effort = A / (Size^B * M)$ **(B)** $Effort = A * Size^B * M$
   (C) $Effort = A * Size * B * M$ **(D)** $Effort = (A * Size^B) / M$

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

Q.2 a. Explain how both the waterfall model and the prototyping model can be accommodated in the spiral process model. **(8)**

  b. What is software risk? Describe the process of risk management. Illustrate your answer with a suitable diagram. **(8)**

Q.3 a. Describe three different types of non-functional requirements which may be placed on a system. Give an example of each of these types of requirement. **(6)**

  b. List and explain in brief the different checks that should be carried out on the requirement in the requirements document. **(5)**

  c. Identify the different types of system models which might be produced during the analysis process. **(5)**

Q.4 a. Explain why it is imperative to define sub-system interfaces in a precise way? Why algebraic specification is particularly appropriate for sub-system interface specification? **(8)**

  b. Differentiate between evolutionary and throw-away prototyping. **(8)**

Q.5 a. Explain why a call-return model of control is not usually suitable for real time systems which control some process. **(4)**

  b. Why are distributed systems inherently more scalable than centralized systems? What are the likely limits on the scalability of a distributed system? **(8)**

  c. Draw an object-oriented architectural model for an invoice processing system. **(4)**

Q.6 a. Using example, differentiate between an object and a class. **(6)**

  b. What is software reuse? List any three advantages and disadvantages of software reuse. **(5)**

  c. What is a component model? Depict diagrammatically elements of a component model. **(5)**

Q.7 a. Discuss the design principles which an user interface designer should take into consideration. **(8)**

  b. List out the constructs in structured programming which are error prone. **(8)**

Q.8 a. What are static program analyzers? Discuss the various stages involved in static analysis.   **(6)**

b. Discuss interface testing. Also identify the different types of interfaces.   **(5)**

c. Describe the various techniques which an organization can employ to estimate the software effort and cost.
(5)

Q.9 a. Comment on the statement "Quality of the development process directly affects the quality of delivered products".   **(4)**

b. Discuss three types of software process metrics that may be collected for process improvement.
(6)

c. What is a system release? Identify the various considerations which help in deciding when a system can be released.   **(6)**