Code: AC16/AT13 **Subject: SOFTWARE ENGINEERING**
Time: 3 Hours **Max. Marks: 100**

JUNE 2011

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. Acceptance testing will be done by

(A) User **(B)** Quality control
(C) Quality assurance **(D)** Senior management

b. Main objective of configuration management is to

(A) Maintain baseline for each version
(B) Build software libraries
(C) Get the right change installed at the right time
(D) All of the above

c. The programmer writes a program step-by-step following _____

(A) Procedure **(B)** Checklist
(C) Process **(D)** Check sheet

d. Function points provide an objective measure of the application system _____that can be used to compare different kinds of application systems.

(A) Size **(B)** Complexity
(C) Performance **(D)** Operation ease

e. Which term defines the process of project compliance with policies and procedures?

(A) Quality control **(B)** Quality assurances
(C) Quality audits **(D)** Quality control management

f. The purpose of requirement phase is

(A) To freeze requirements **(B)** To understand user needs
(C) To define the scope of testing **(D)** All of the above

g. Inspections can find all the following except

(A) Variables not defined in the code
(B) Spelling and grammar faults in the documents
(C) Requirements that have been omitted from the design documents
(D) How much of the code has been covered

h. A reliable system will be one that:

(A) Is unlikely to be completed on schedule
(B) Is unlikely to cause a failure
(C) Is likely to be fault-free
(D) Is likely to be liked by the users

i. A regression test:

(A) Will always be automated
(B) Will help ensure unchanged areas of the software have not been affected
(C) Will help ensure changed areas of the software have not been affected
(D) Can only be run during user acceptance testing

j. Verification is:

(A) Checking that we are building the right system
(B) Checking that we are building the system right
(C) Performed by an independent test team
(D) Making sure that it is what the user really wants

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

Q.2 a. Differentiate among "error", "fault" and "failure" as applied to software. **(6)**

b. What is a prototype? Why do you think building prototype is popular with clients/users? **(6)**

c. Distinguish between goals, requirements and constraints. **(4)**

Q.3 a. What are the features of an effective change control procedure? Distinguish between change control and version control. **(8)**

b. Why do you require software matrics? **(4)**

c. Compare the key characteristics of the ISO 9000 certification with those of the SEI CMM model for quality appraisal. **(4)**

Q.4 a. Describe various characteristics of software requirements that make requirement analysis one of the most crucial activities in software projects. **(6)**

b. Generate a Context level and a level-I DFD for a library management system. Make suitable assumptions wherever necessary. **(6)**

c. What are disadvantages of using size metric LOC? **(4)**

Q.5 a. What is a function point metric? How it is used to assess the size and cost of a software project? **(8)**

b. What are the various categories of cost estimation approaches? Describe the merits and demerits of COCOMO model. **(8)**

Q.6 a. Make a checklist of architectural design assessment questions to assess the architecture of any software system. Explain the various architecture styles that can be adopted while designing the software system. **(8)**

b. Consider the example of modeling the objects in Simple Filing System:
- Every object in the filing system has a name, a date modified, and set of permissions (read, write, execute).
- Some objects, known as directory objects, are containers of any kind of object in the filing system. Other objects, known as file objects, do not contain other filing system objects.
- Objects cannot be shared among containers.
- A directory object allows addition, deletion and listing of any of its contents.
- A file object has a size (in bytes) and a file type associated with it (e.g., text file, executable file,…) as well as an open method. For a text file, the open method should launch a text editor; for an executable file, the open method should launch the executable.

Draw the class diagram and instance diagram for the above example. **(8)**

Q.7 a. Explain the following terms related to reliability:
(i) Basic Model
(ii) Logarithmic Poisson Model. **(8)**

b. Explain the meaning of a design pattern. What are the design pattern specification components? **(4)**

c. Give a brief note on Code inspectors. **(4)**

Q.8 a. What is the difference between white and black box testing? Is determining test cases easier in black or white box testing? Is it correct to claim that if white box testing is done properly, it will achieve close to 100% path coverage? **(8)**

b. How equivalence class partitioning and boundary value analysis are different from each other? Are they used in functional or nonfunctional testing? **(8)**

Q.9 a. Differentiate between Quick Fix model and Iterative Enhancement Model. **(8)**

b. Explain the term system re-engineering. When should the system be re-engineered? What are the advantages of re-engineering the system? **(4)**

c. Define the concept of Managing Risk and discuss its major components. **(4)**