



Name :

Roll No. :

Invigilator's Signature :

**CS/B.TECH (IT)/SEM-6/IT-601/2010
2010**

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) What types of abstraction are used in software design ?
 - a) Control
 - b) Data
 - c) Procedural
 - d) All of these.
- ii) To achieve good design, modules should have
 - a) weak cohesion and low coupling
 - b) weak cohesion and high coupling
 - c) strong cohesion and low coupling
 - d) strong cohesion and high coupling.



- iii) Code review for a module is carried out
 - a) after the module is successfully compiled and all the syntax errors have been eliminated
 - b) as soon as skeletal code written
 - c) before the module is successfully compiled
 - d) before the module is successfully compiled and all the syntax errors have been eliminated.
- iv) An integration testing approach, where all the modules making up a system are integrated in a single step is known as
 - a) top-down integration testing
 - b) bottom-up integration testing
 - c) big-bang integration testing
 - d) mixed integration testing.
- v) When a system interfaces with other types of systems then that time the testing that will be required is
 - a) volume testing b) configuration testing
 - c) compatibility testing d) maintenance testing.
- vi) An example of single variable heuristic cost estimation model is
 - a) Halstead' software science
 - b) basic COCOMO model
 - c) intermediate COCOMO model
 - d) complete COCOMO model.



- vii) Data processing programs are considered as
- a) utility programs b) system programs
 - c) application programs d) none of these.
- viii) Pure egoless programming is encouraged by which team organization ?
- a) Chief programmer team structure
 - b) Democratic team structure
 - c) Mixed control team structure
 - d) None of these.
- ix) Schedule slippage is a type of
- a) Business risk b) Project risk
 - c) Technical risk d) none of these.
- x) For effective configuration control, in order to change a controlled object such as a module, a developer can get a private copy of the module by using
- a) Restore operation b) Reserve operation
 - c) Update operation d) none of these.
- xi) The type of failure that occurs for all input values while invoking a function of the system is
- a) transient failure
 - b) permanent failure
 - c) recoverable failure
 - d) unrecoverable failure.



- xii) The basic premise of modern quality assurance is
- a) continuous process improvement
 - b) thorough product testing
 - c) if an organization's processes are good and are followed rigorously then the products are bound to be of good quality
 - d) collection of process metrics.
- xiii) Which of the following life cycle models deals with risks associated with software products ?
- a) Prototyping model b) Waterfall model
 - c) Spiral model d) Incremental model.
- xiv) Software failure rate is highest during
- a) Design phase b) Testing phase
 - c) Implementation phase d) Installation phase.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) What is feasibility study ?
- b) Explain different types of feasibility study. $1 + 4$
3. a) Explain the topic given below :
- When the schedule of a project is compressed, the required effort increases in proportion to the fourth power of the degree of compression.
- b) Why is COCOMO called heuristic estimation technique ?

$4 + 1$



4. a) Differentiate between equivalence class partitioning and boundary value analysis techniques. 3 + 2
- b) What are the software testing tools ? 3 + 2
5. a) Define software quality. 1 + 4
- b) Briefly explain McCall's quality factors. 1 + 4
6. a) What is statistical testing ? 2 + 3
- b) Differentiate between verification testing and validation testing. 2 + 3

GROUP – C

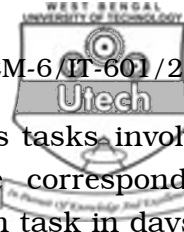
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What are the differences between Black box testing and White box testing ? 5
- b) Discuss the roles of 'stubs' and 'drivers' in integration testing. 5
- c) Define quality assurance and quality control. 5
8. What is quality ? What is software quality assurance ? Describe the software quality assurance group along with its function. Describe how the various types of reviews that can take place during software development vary in formality. What is user interface design process ? 2 + 3 + 3 + 3 + 4



9. a) What is COCOMO model ? What are the different categories of software development projects according to COCOMO estimation model ? 2 + 3
- b) What is Prototyping ? Is the spiral model of software development a Risk Management model ? Discuss in brief. 2 + 4
- c) Why do we need to estimate software cost ? What are the methods of estimation ? 4
10. a) Can a software execute properly if it is not tested ? Explain. 2
- b) Define how to construct control flow graphs for programs containing structured statements such as repeat-until, case and if. 3
- c) Consider the following program statement :
- ```
void sort (int a[], int n)
{
 int i, j, temp ;
 for (i = 0; i<n-1; i++)
 for (j = i + 1; j<n; j++)
 if (a [i] > a [j])
 {
 temp = a [i] ;
 a [i] = a [j] ;
 a [j] temp ;
 }
}
```
- i) Draw the control flow graph for the program segment. 3
- ii) Determine the cyclomatic complexity for the program. 3



- d) The following table indicates the various tasks involved in completing a software project, the corresponding activities, and the estimated time of each task in days.

| <b>Notation</b> | <b>Activity</b>      | <b>Estimated time in days</b> |
|-----------------|----------------------|-------------------------------|
| $T_1$           | Specification        | 15                            |
| $T_2$           | Design database part | 45                            |
| $T_3$           | Design GUL part      | 30                            |
| $T_4$           | Code database part   | 105                           |
| $T_5$           | Code GUI part        | 45                            |
| $T_6$           | Integrate and test   | 120                           |
| $T_7$           | Write user manual    | 60                            |

The precedence relation  $T_i \leq \{T_j, T_k\}$  implies that the task  $T_i$  must complete before task  $T_j$  or  $T_k$  can start. The following precedence relation is known to hold among different tasks :

$T_1 \leq \{T_2, T_3\} \leq \{T_4, T_5\} \leq T_6$  and  $T_7$  can start after  $T_1$  is complete. Draw the activity network and the Gantt chart representation for the project. 4

11. Write short notes on any *three* of the following : 3 × 5

- RAD model
- McCall's quality triangle
- Feasibility study
- Unit testing
- DFD.

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