



## AUTUMN END SEMESTER EXAMINATION-2018

5<sup>th</sup> Semester B.Tech & B.Tech Dual Degree

### SOFTWARE ENGINEERING

IT-3003

[For 2017(L.E.), 2016 & Previous Admitted Batches]

Time: 3 Hours

Full Marks: 60

*Answer any Six questions including question No.1 which is compulsory.*

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.*

1. (a) Explain if the following statement true or false -There are [2×10] well defined steps through which a problem is solved in exploratory style.
- (b) Without developing SRS document, an organization might face severe problems. (True / False) Justify.
- (c) What are the non-functional requirements which need to be captured well advance in a software project?
- (d) Explain the role of abstraction in software design.
- (e) List the advantages ad limitations of prototype life cycle model.
- (f) “Statement coverage based testing is stronger testing strategy than branch coverage based testing.” (True/ False) Justify your answer.
- (g) How debugging is different from testing? List the types of debugging.
- (h) What do you understand by adaptive maintenance? Explain with example.

- (i) Differentiate between function oriented design and object oriented design.
- (j) What is the difference between code walkthrough and code inspection?
2. (a) Suppose you are the project manager of a software project requiring the following activities:

[4]

Activity No.	Activity Name	Duration (weeks)	Immediate Predecessor
1	Obtain requirement	3	-
2	Analyze operation	3	-
3	Define subsystem	1	1
4	Develop database	3	1
5	Make decision analysis	2	2
6	Identify Constraints	1	5
7	Build Module 1	7	3, 4, 6
8	Build Module 2	11	3, 4, 6
9	Build Module 3	17	3, 4, 6
10	Write report	9	6
11	Integration and Test	7	7, 8, 9
12	Implementation	1	10, 11

- (a) Draw the Activity Network representation of the project.
- (b) Identify the critical path.
- (c) Determine Earliest Start, Earliest Finish, and Latest Start, Latest Finish for every task.
- (b) (i) What do you understand by software configuration management? What is the need for it?
- (ii) Explain how Mixed control team is evolved from Chief-programmer team and Democratic team.

[4]

3. (a) What do you understand by CMM? Discuss the various Key Process Areas present in various CMM levels. How CMM is different from ISO? [4]
- (b) What are the shortcomings of LOC in software size estimation? In what way Function point metric overcomes them? Explain the factors we consider for function point metric. [4]
4. (a) What do you understand by the term cohesion and coupling in the context of software design? [4]
- Explain various types of cohesion and coupling with suitable examples. Explain the desired degree of cohesion and coupling for a good software design.
- (b) i) Perform Structured Analysis and Structured Design by using the operations of a simple lemonade stand. The list of activities are as given below:  
*Customer Order, Serve Product, Collect Payment,  
Produce Product, Store Product,  
Order Raw Materials, Pay for Raw Materials,  
Pay for Labour*
- ii) Briefly discuss the significance of a data dictionary in structured analysis. [4]
5. (a) What are the differences between Agile and Water fall model? Explain the scrum methodology in details. [4]
- (b) Define a test case. Discuss about the following techniques to perform black box testing with suitable example. [4]
- I. Equivalence Class Partitioning  
II. Boundary value Analysis

6. (a) How Unified Modeling Language is helpful in object-oriented design? Draw a UML Sequence diagram and UML Activity diagram for “*Borrowing a Book from a library*” use case. [4]

- (b) What is Cyclomatic Complexity? Draw the control flow diagram of the below program segment and find the Cyclomatic complexity. [4]

```
int find-maximum (int i, int j, int k)
{
    int max;
    if (i > j) then
        if (j > k) then max = i;
        else max = k;
    else (j > k) then
        If (j > k) then max = j;
        else max = k;
    return (max); }
```

7. (a) Briefly explain the various reliability metrics of software products. [4]

- (b) How software reverse engineering is different from software re-engineering? Discuss about the different cosmetic changes made during the software reverse engineering. [4]

8. Write short notes on any TWO of the following: [4 × 2]

- (a) Verification and Validation.
- (b) Pert Chart and Gantt Chart
- (c) UML Diagrams
- (d) Top down and Bottom Up Integration Testing

\*\*\*\*\*