

**BACHELOR OF INFORMATION TECHNOLOGY ENGG. EXAMINATION, 2022**2<sup>nd</sup> year, 2<sup>nd</sup> semester**Software Engineering**

Time: 3 Hours

Full Marks: 100

Read the questions carefully and answer them.

**CO1: Answer any two questions**

Full marks: 20

1. (a) With a clear diagram explain the Waterfall model for software development.  
(b) When do we prefer to use this model for software development?  
(8+2)
2. (a) Which phase consumes maximum effort for developing a typical software product?  
Explain the reason.  
(b) Among all phases of software development, an undetected error from the design phase that ultimately gets detected during the system acceptance test costs the maximum. Explain the reason.  
(4+6)
3. (a) With a clear diagram explain Spiral life cycle model for software development.  
(b) Differentiate between a waterfall model and a spiral model.  
(7+3)

**CO2: Answer any two questions**

Full marks: 20

4. (a) What are the important activities that are carried out during the requirements engineering phase? What are the main activities for scheduling a software project?  
(b) Explain about the various types of system modeling.  
(3+2+5)
5. Consider the following set of activities.

Activity Number	Activity Name	Duration (weeks)	Immediate Predecessor
1	Requirement Engineering	4	---
2	System Design	4	1
3	Develop Interface	4	2
4	Build Database	2	2
5	Build Modules	8	3, 4
6	Write Manual	10	2
7	System Testing	8	5
8	Implementation and Maintenance	2	7

- (a) Draw an Activity Network for the following project. Find out the critical path?
- (b) Draw the Gantt chart representation of the project.

(3+2+5)

6. (a) What are the relative advantages of using either the LOC or the function point metric to measure the size of the software?

- (b) If an organic project requires 160 person-months (PM) as its effort to complete the project, calculate the size and the development time for basic COCOMO. (5+5)

**CO3: Answer all questions**

**Full marks: 20**

7. (a) What are the various types of Cohesion are there? Explain with examples.  
 (b) Differentiate between structured analysis and structured design in the context of function-oriented design.  
 (c) Design a DFD of level-1 for the following system.  
 Design the following for a simple "Project Proposals Management System". The project proposals of UG programs are entered into the system by the student. The final year students of UG submit their project proposals to the system. When a project proposal details are entered into the system, a PP\_NO will be issued. Further, all proposals are sent for evaluation by the approved project proposal evaluators. After receiving the evaluation report, the status and other remarks are noted and sent back to the students.

**(6+4+10)**

**CO4: Answer any 3 questions**

**Full marks: 30**

8. (a) Discuss with the help of appropriate examples:  
 (i) Condition coverage criterion and  
 (ii) Path coverage criterion in the context of software testing;  
 (b) Which one of the following is the strongest structural test technique: Statement coverage-based testing, branch coverage-based testing, or condition coverage-based testing?  
**(4+4+2)**
9. (a) What do you understand by 'Code Review'?  
 (b) Differentiate between verification and validation.  
 (c) Explain Top-Down Implementation and Testing with a diagram.  
**(3+2+5)**
10. (a) What is a 'Mutant'? When do we use mutation testing?  
 (b) Define "Cyclomatic Complexity". Explain the process of finding out the link weight of Flowgraph with an example.  
**(2+2+2+4)**
11. (a) What do you understand by the term system testing?  
 (b) Explain clearly Black Box Testing and White Box Testing.  
 (c) Differentiate between the Alpha and Beta testing.  
**(2+4+4)**

**CO5: Answer the following question**

**Full marks: 10**

12. Write short notes on any **two**:  
 (i) Responsibilities of Software Quality Assurance.  
 (ii) People Capability Maturity Model.  
 (iii) SQM Techniques.

**(5+5)**