Printed Page:- 04

Subject Code:- BCSBS0304

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2024 - 2025)

Subject: Software Engineering

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-a. To produce a good quality product, process should be- (CO1, K2) 1

(a) Complex
(b) Efficient
(c) Rigorous
(d) None

1-b. Which of the following is the Characteristics of good software? (CO1, K2) 1

(a) Transitional
(b) Operational
(c) Maintenance
(d) All of the above

1-c. Which phase in the Waterfall Model corresponds to the coding phase? (CO2, K4) 1

(a) System Design
(b) Integration and Testing
(c) Acceptance Testing
(d) Coding and Unit Testing

1-d. Estimation of size for a project is dependent on (CO2, K4) 1

(a) Cost
(b) Schedule
(c) Time

(d) None of the above

1-e. Quality Management in software engineering is also known as (CO3, K3) 1

(a) SQA
(b) SQM
(c) SQI
(d) SQA and SQM

1-f. In CMM, which maturity level signifies a process that is unpredictable and poorly controlled? (CO3, K3) 1

(a) Level 1 - Initial
(b) Level 2 - Managed
(c) Level 3 - Defined
(d) Level 4 - Quantitatively Managed

1-g. What are the main components of a decision table? (CO4, K4) 1

(a) Conditions, Actions, Rules
(b) Inputs, Outputs, Processes
(c) Variables, Functions, Loops
(d) Classes, Objects, Methods

1-h. __Which of the following is true about DFDs? (CO4, K4) 1

(a) DFDs show the implementation details of a system.
(b) DFDs focus on the physical components of a system.
(c) DFDs are a graphical tool used for modeling system processes and data flows.
(d) DFDs only represent the control flow within a system.

1-i. White Box techniques are also classified as (CO5, K2) 1

(a) Design based testing
(b) Structural testing
(c) Error guessing technique
(d) None of the mentioned

1-j. What is regression testing? (CO5, K2) 1

(a) Testing the software after each change to ensure that the new code doesn't adversely affect existing functionalities.
(b) Testing the software's performance under heavy loads.
(c) Testing the software's compatibility with different operating systems.
(d) Testing the software's user interface and user experience.

2. Attempt all parts:-

2.a. Define bugs, errors, fault and failures in software ? ((CO1, K2) 2

2.b. Explain and draw waterfall Model? (CO2, K4) 2

2.c. What is the difference between recoverable failure and non-recoverable failure. (CO3, K3) 2

2.d.	Define an SRS document and list its characteristics. (CO4, K4)	2
2.e.	Define test cases in testing? (CO5, K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	How are software myths affecting software process? Explain with the help of examples. (CO1, K2)	6
3-b.	Describe the advantages of iterative development. Also compare iterative development with Incremental delivery approach. (CO1, K2)	6
3-c.	Explain the concepts of coupling and cohesion with suitable examples. (CO2, K4)	6
3-d.	Briefly explain the effort equation and development time (Tdev) equations for the Basic, Intermediate, and Detailed COCOMO Models. (CO2, K4)	6
3.e.	Describe the key quality attributes defined in the ISO 9126 Software Quality Model. How do these attributes contribute to assessing software quality? (CO3, K3)	6
3.f.	Describe the 5 stages of requirement gathering in detail. (CO4, K4)	6
3.g.	Explain concept of boundary value analysis with example. (CO5, K2)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Differentiate between programming in large vs programming in small in reference to research paper published by Frank DeRemer and Hans Kron. (CO1, K2)	10
4-b.	Write short note on the following failures: (CO1, K2) (i) Transient failure (ii) Non-corruption failure (iii) Recoverable failure	10

5. Answer any one of the following:-

5-a.	Explain the following models with diagram: (CO2, K4) (i) Spiral model (ii) Iterative model (iii) Prototyping model.	10
5-b.	A company needs to develop digital signal processing software for one of its newest inventions. The software is expected to have 20000 lines of code. The company needs to determine the effort in person-months needed to develop this software using the basic COCOMO model. The multiplicative factor for this model is given as 2.2 for the software development on embedded systems, while the exponentiation factor is given as 1.50. Find out the estimated effort in person-months. (CO2, K4)	10

6. Answer any one of the following:-

6-a.	Explain the Calendar Time Component Model and describe how calendar time relates to execution time. What factors influence the relationship between these two types of time in the context of system performance or task processing? (CO3,	10

K3)

6-b. Explain the following terms: 10
(i) Operational Profile
(ii) Input space
(iii) MTBF
(iv) MTTF
(v) Failure intensity (CO3, K3)

7. Answer any <u>one</u> of the following:-

7-a. Describe the different types of software metrics used in software engineering. What are their advantages and disadvantages? (CO4, K4) 10

7-b. Create an Use Case Diagram for an ATM system and identify at least three types of relationship or associations between the use cases. Also, specify at least three modality relationships in the diagram. (CO4, K4) 10

8. Answer any <u>one</u> of the following:-

8-a. (i) Explain alpha testing and beta testing in detail. What are the key differences and objectives of each? 10
(ii) Define integration testing, including its purpose and typical outcomes. (CO5, K2)

8-b. Explain various concepts of Object oriented design. Explain the importance of it in Software engineering while developing software. (CO5, K2) 10