No. of Printed Pages : **4**

Sl. No.

B1.3-R5 : SOFTWARE ENGINEERING

DURATION : 03 Hours **MAXIMUM MARKS : 100**

Roll No. : | | | | | | |

Answer Sheet No. : | | | | | | |

Name of Candidate : _____ **; Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English Language only.
- **Question paper contains Seven questions. The Question No. 1 is compulsory. Attempt any FOUR Questions from Question No. 2 to 7.**
- **Parts of the same question should be answered together and in the same sequence.**
- **Questions are** to be answered in the **ANSWER SHEET** only, supplied with the Question Paper.
- **Candidate cannot leave the examination hall/ room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

1. (a) Define the term "Software Engineering". Explain Software Engineering as modern profession.

(b) What is correctness of requirements specification ? How it is different from consistency ?

(c) Explain the importance of software design in Software Development Life Cycle.

(d) "UML (Unified Modeling Language) is a standardized language in software engineering". Justify this statement.

(e) What is difference between Verification and Validation of software ? Explain its importance in software testing.

(f) What is Clean Room Approach and Strategy related to software engineering ?

(g) What do you mean by internal and external metrics of a software module ?

(7x4)

2. (a) Describe the key activities involved in the software design process. How does functional independence support effective software design ?

(b) Timing Diagrams helps us to understand real-time systems. Comment. Also, create a timing diagram for a traffic light control system.

(c) Discuss the characteristics of a good SRS (System Requirement Specification) documents.

(6+6+6)

3. (a) What do you mean by CASE tools for software planning, development and evaluation ? Explain CASE tools classification.

(b) What do you mean by Modular Design ? How does a modular design enhance life cycle of a software product ?

(c) How procedural modeling, data modeling and object-oriented modeling are different from each other ?

(6+6+6)

4. (a) Consider a Library Management System and Explain the following types of UML diagrams and their uses :

(i) Use Case Diagram

(ii) Class Diagram

(iii) Component Diagram

(b) Explain the difference between :

(i) Aggregation and composition in UML class diagram

(ii) Coupling and Cohesion in modular design

(iii) DFD (Data Flow Diagram) and Flow Chart **(9+9)**

5. (a) Explain software testing process and different steps involved in it.

(b) Discuss the benefit of starting testing at the earlier phases of software development.

(c) Explain how formal specification methods are used in software engineering by giving a suitable example. Also compare the informal, semi-formal and formal methods.

(6+5+7)

6. (a) What is the difference between functional and non-functional requirements ? Give one example of each type of requirement for "Online Examination System" software.

(b) What do you mean by Object-Oriented Software Engineering ? How it is different from Service-Oriented Software Engineering ?

(c) What are the essential conditions for software re-engineering to be successful ?

(9+5+4)

7. (a) Compare top-down and bottom-up integration and testing with their advantages and disadvantages for architectural testing, demonstrating a version of the system to users and for the practical implementation and observation of tests. Also, explain why most large system integration, has to use a mixture of top-down and bottom-up approaches.

(b) What do you mean by real-time software design ? Explain the issues related to real-time software design.

(c) What is software maintenance ? What are the different types of software maintenance tasks ?

(7+6+5)

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SPACE FOR ROUGH WORK