

**2021**

**COMPUTER SCIENCE — GENERAL**

**Paper : SEC-A-2**

**(Software Engineering)**

**Full Marks : 80**

*The figures in the margin indicate full marks.*

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

Answer **question no. 1** and **any six** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) What do you mean by meta model?
  - (b) What is KLOC?
  - (c) What do you understand by view level in data model?
  - (d) Why is low coupling desirable?
  - (e) What is a context diagram?
  - (f) Define cyclomatic complexity.
  - (g) What do you mean by non-functional requirement? Give an example.
  - (h) Write two limitations of Waterfall model.
  - (i) What do you mean by poor modular design solution?
  - (j) What is a structure chart?
  - (k) What are the components of a DFD?
  - (l) What is functional testing?
  - (m) Write the full form of COCOMO.
  - (n) What problems arise if a model has low cohesion?
  - (o) What is decision tree?
2. (a) State attributes of a 'Quality Software'.  
(b) Discuss the spiral model for SDLC and mention the utility of it over Waterfall model. 4+6
3. (a) Discuss the differences between Black box and White box testing.  
(b) What do you mean by Software reliability?  
(c) Why functional independence is needed for good modular design? 4+2+4

**Please Turn Over**

4. (a) Discuss briefly about different types of Cohesion that a module may possess.  
(b) Write the characteristics of good SRS document. 6+4
5. (a) Why is integration testing necessary? Discuss briefly about different types of integration testing techniques.  
(b) Differentiate between verification and validation process of a developing software.  
(c) What is mutation testing? (1+4)+3+2
6. (a) What is system testing?  
(b) Discuss briefly about Alpha testing, Beta testing and Acceptance testing.  
(c) What is CFG? Design a CFG for the following code segment.  
1. While (a > b) {  
2. b = b - 1;  
3. b = b \* a; }  
4. c = a + b; 2+3+(2+3)
7. (a) What do you mean by physical DFD and Logical DFD? Discuss with suitable examples.  
(b) What does the term “balancing a DFD” mean?  
(c) Differentiate between DFD and flow chart. (3+3)+2+2
8. (a) What are the main shortcomings of Data Flow Diagram (DFD) as a tool for performing structured analysis?  
(b) Design the black-box test suite by equivalence class partitioning for the following program. The program computes the intersection point of two straight lines and displays the result. It reads two integer pairs (m1, c1) and (m2, c2) defining the two straight lines of the form.  $y = mx + c$ . 4+6
9. (a) Write down the importance of data dictionary in the content of good software design.  
(b) Write short notes on Waterfall model. 3+7
10. (a) How are the risks associated with a project handled in the spiral model of software development?  
(b) Explain why it is not prudent to use the interactive waterfall model for developing very large software products.  
(c) What is fan-in and fan-out in modular design? 4+4+2
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