

M.Sc. 1st Semester Examination, 2022 (CBCS)

Subject : Computer Science  
(Advanced Software Engineering)

Course : MSCS-103

Time: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates are required to give their answers in their own words  
as far as practicable.*

Answer any five questions.

8×5=40

1. (a) Briefly explain the following four “values” mentioned in the “agile manifesto”.
  - (i) Individuals and interactions over process and tools
  - (ii) Working software over comprehensive documentation
  - (iii) Customer collaboration over contract negotiation
  - (iv) Responding to change over following a plan

(b) What is “sprint”? Explain.

(c) What are validation and verification? 4+2+2
2. (a) What do you mean by the terms.
  - (i) Scalability
  - (ii) Predictability
  - (iii) Productivity

with respect to Software Engineering? Explain.

(b) What do you mean by “baselining” in case of Software Configuration Management? Explain.

(c) Define and indicate the Key Process Areas (KPA) for the following levels prescribed in SEI CMM:
  - (i) Repeatable (2)
  - (ii) Defined (3)
  - (iii) Managed (4) 3+2+3
3. (a) Explain the concepts of forward referencing and traceability with respect to Software Requirement Specification (SRS).
- (b) Specify and explain any two (2) specific needs for “formal” specification.
- (c) Define (and, give example of) pre-condition, post-condition and semantic with respect to formal specification. 3+2+3
4. (a) Briefly explain (with suitable diagram) Model-View-Controller (MVC) Architecture (pattern).
- (b) With the help of suitable examples, differentiate between logical and physical flow of data. 4+4

5. (a) Explain (with suitable diagram) actor, reactor and agent with respect to OOAD (Booch).  
 (b) What is stereotyping in UML? Why is it required?  
 (c) Explain cohesion w.r.t. Software Design. Explain any one type of cohesion in Object Oriented Design. 3+2+(2+1)
6. (a) What do you mean by "Code Profiling"? Explain.  
 (b) What is "Refactoring"? Why is it required?  
 (c) What do you mean by "Software Reuse"? Explain the issue of "Component Adaptation". w.r. to Software Reuse. Is the following "C" function reusable? Comment on your yes/no type answer.  

```
int square (int x){
return (x*x);
}
```

2+2+(1+1+2)
7. (a) Define and explain "Reliability" quality parameter. Also define and explain any two (2) metrics for that.  
 (b) Classify the following metrics into two (2) classes, namely product metrics and process metrics:  
 (i) Average number of defects found per hour of inspection  
 (ii) Function Point (FP)  
 (iii) Person-Month (PM)  
 (iv) Time-Complexity of the algorithms  
 (c) What do you mean by termination analysis (Postmortem analysis) with respect to PM-Process? (2+2)+2+2
8. (a) Briefly explain the following types of coverages with respect to white-box testing:  
 (i) Branch  
 (ii) Path  
 (b) What is "Regression Testing"?  
 (c) With suitable diagram, explain (in brief) different components in the environment (common framework) required for Computer Aided Software Engineering (CASE). (1½+1½)+2+3

Or,

Write short notes (any two):

4×2=8

- (i) Prototyping Model
- (ii) Black Box Testing
- (iii) Cocomo Model