



AUTUMN MID SEMESTER EXAMINATION-2023

School of Computer Engineering
Kalinga Institute of Industrial Technology, Deemed to be University
Software Engineering
[IT-3003]

Time: 1 1/2 Hours

Full Mark: 40

Answer Any four Questions including Question No. 1 which is compulsory.

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable and all parts of a question should be answered at one place only.

1. Answer all the questions. [2 x 5]
 - a) What impact does pair programming have on the development of user stories?
 - b) Do you agree with the following statement - (Mention True/False)—The focus of exploratory programming is error correction while the software engineering principles emphasis error prevention"? Give the justifications behind your answer.
 - c) Discuss the Agile Manifesto/Philosophy.
 - d) What is the difference between the functional and the non-functional requirements of a system? Identify at least two functional requirements of the online Railway Reservation System.
 - e) What do you mean by project size? What are the popular metrics to measure project size?
2. (a). Briefly explain the important differences and similarities between the incremental and evolutionary models of SDLCs. [5 Marks]
(b). What do you understand by the problems of overspecification, inconsistent requirements, and noise in an SRS document? Explain each of these with suitable examples. [5 Marks]
3. (a). "According to the COCOMO model, if the size of a software is increased by two times, the time to develop the product usually increases by less than two times", justify your answer. [5 Marks]
(b). Calculate Function point for an upcoming online healthcare website project which has the following function and feature details -
Number of User Inputs: 40, Number of User outputs: 20, Number of user enquiries: 20. The data will be stored and retrieved from the patient file, medicine details file and order details (transaction) file. The application has two external interfaces for the payment.

From the above details, 20 user inputs are simple and remaining inputs are complex. All outputs are complex. 10 user enquiries are simple searches and hence, can be considered to be as simple. Remaining enquiries are complex. All data-structures/logical files are complex. Both the interfaces are simple. All 14 influencing parameters have moderate impact. Hence, Degree of influence is 42. [5 Marks]

4. (a). Consider a software project development scenario that consists of the activities namely A, B, C, D, E, F, G, H, I, and J. The duration, in weeks, of the activities is 10, 6, 7, 5, 9, 8, 4, 12, 7, and 9 respectively. While doing the analysis, the team observed that activities A, D, and G can be started in parallel. Activity B can be started after the completion of activity A. Again, activities C can be started only when B and D gets over. Activities E can start only if the activity C is complete. After the completion of activity E, the team can start activity F and H. When activity G is completed, the team can initiate the work on activities H and I. After the completion of activity I, activity J can be initiated. Do the following for the above discussed scenario:

- I. Draw the activity network diagram.
- II. Determine the critical path.
- III. Calculate the slack for activity C and I.

[5 Marks]

- (b). What are the appropriate circumstances for using the RAD model? Discuss the strength and weakness of the RAD model. Also, compare the RAD model with the Spiral model.

[5 Marks]

- 5 (a). Assume that the development of a software project requires a large number of team members, and a lot of innovations. The requirements are not stable and hence, lots of risks are associated with the project. The size of the project has been estimated to be 20,100 source lines of code. Assume that the average salary of software engineers is Rs. 40,000/- per month. Calculate the following:

- I. Effort required to develop the software product
- II. Development time
- III. Productivity
- IV. Average staff
- V. Cost to develop the project

[5 Marks]

- (b). What do you understand by the principles of abstraction and decomposition? Why are these two principles considered important in software engineering? Explain the problems that these two principles target to solve? Support your answer using suitable examples. [5 Marks]