

[No. of Printed Pages – 4]

IT301

Enrol. No.

[ET]

END SEMESTER EXAMINATION : NOV.–DEC., 2017

SOFTWARE ENGINEERING

Time : 3 Hrs.

Maximum Marks : 70

Note: Attempt questions from all sections as directed.

SECTION – A (30 Marks)

Attempt any five questions out of six.

Each question carries 06 marks.

1. Discuss the significance and use of requirement engineering. What are functional and non-functional requirements?

2. Explain in detail an Elevator system using the State Transition diagram.

3. Mention the important phases of spiral model of Software development. Compare the relative merits and demerits of spiral model with the prototype model.

4. List the different types of risks that a typical software might suffer from during the development phase. Explain essential strategies for Risk Identification and Risk Analysis.

P.T.O.

5. Is software a product or a process? Which according to you has more relevance the product or process. Justify your answer with the help of suitable example.

6. Explain the metric Function Count. Compute the function point value for a project with the following information domain characteristics:

Number of user inputs=50

Number of user outputs=44

Number of user enquiries=18

Number of internal logic files=30

Number of external interface files=16

Assume that all weighing factors are average and all complexity adjustment factor values are essential.

SECTION - B (20 Marks)

Attempt any two questions out of three.

Each question carries 10 marks.

7. (a) Consider a program for the determination of the nature of roots of a quadratic equation. Its input is a triple of positive integers (say a,b,c) and values may be in the interval [0,100]. The program output may have one of the following words.

[Not a quadratic equation; Real roots; Imaginary roots; Equal roots].

Identify the equivalence class test cases for input and output domains.

(5)

- (b) Explain coupling among modules of a Software. Discuss the types of Coupling with regard to design of a Software. (5)
8. (a) Some experimental evidence suggests that the initial size estimate of a project affects the nature and the results of the project. Consider two different managers charged with developing the same application. One estimates that the size of the application will be 50,000 lines, while the other estimates that it will be 100,000 lines. Discuss how these estimates affect the project throughout its life cycle. (5)
- (b) Discuss the purpose of Information Flow Metrics during development of a Software Project. (5)
9. (a) What is a software failure? Explain necessary and sufficient conditions for software failure. Discuss strategies for good test case design that has high probability of finding an as yet undiscovered error. (5)
- (b) Briefly discuss and differentiate between the following :
- (i) Verification & Validation
 - (ii) Alpha and Beta testing (5)

10. (a) A software has to be developed for automating the manual library of a University. The system should be stand alone in nature. It should be designed to provide functionalities as explained: Issue of books, Return of books, Query processing and Report Generation. Generate the following UML diagrams for this case :

- (i) Use Case diagram
 - (ii) Class diagram

- (b) Admission to a professional course is subject to the following conditions :

Marks in Mathematics ≥ 60

Marks in Physics ≥ 50

Marks in Chemistry >=40

Marks in all three courses ≥ 200

If aggregate marks of an eligible candidate are more than 225, he/she will be eligible for honors course, otherwise he/she will be eligible for pass course. The program reads the marks in the three courses and generates the following outputs :

- (i) Not Eligible
 - (ii) Eligible to Pass Course
 - (iii) Eligible to Honors Course

Design test cases using decision table testing technique.

[No. of Printed Pages - 4]

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SOFTWARE ENGINEERING

Time : 3 Hrs.

Maximum Marks : 70

Note: Attempt questions from all sections as directed.

SECTION - A (30 Marks)

Attempt any five questions out of six.

Each question carries 06 marks.

1. Explain iterative waterfall and spiral model for software life cycle and discuss various activities in each phase.
2. An application has the following:
 - 10 low external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 average external inquiries and a value of CAF of 1.10.
 - What are the unadjusted and adjusted FP counts?
3. Difference between functional and non-functional requirements.

P, O, E ..

P.T.O.

4. Define Maintenance. Explain the process of maintenance with the help of diagram.

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5. Difference between Class diagrams and Use case diagrams.

6. (a) Define SRS. What are the characteristics of SRS? (3)

- (b) Difference between black box testing and white box testing? (3)

SECTION – B (20 Marks)

Attempt any two questions out of three.

Each question carries 10 marks.

7. (a) Explain in detail the difference between CMM and ISO. (5)

- (b) What is a Risk? Explain the various types of Risks. (5)

8. Consider a program for determination of nature of roots of a quadratic equation. Its input is a triple of positive integers (a,b,c) and values may be from

[0,100]. The following output may be of the following words :

(not a quadratic equation, Real roots, Imaginary roots, Equal Roots)

Design the Equivalence partitioning classes.

9. (a) With the help of diagram, explain Spiral model. Write the weaknesses and strengths of Spiral model. (5)
- (b) Suppose that a project was estimated to be 400 KLOC. Calculate the effort and development time for each of the three modes i.e. organic, semidetached and embedded. (5)

SECTION – C (20 Marks)
(Compulsory)

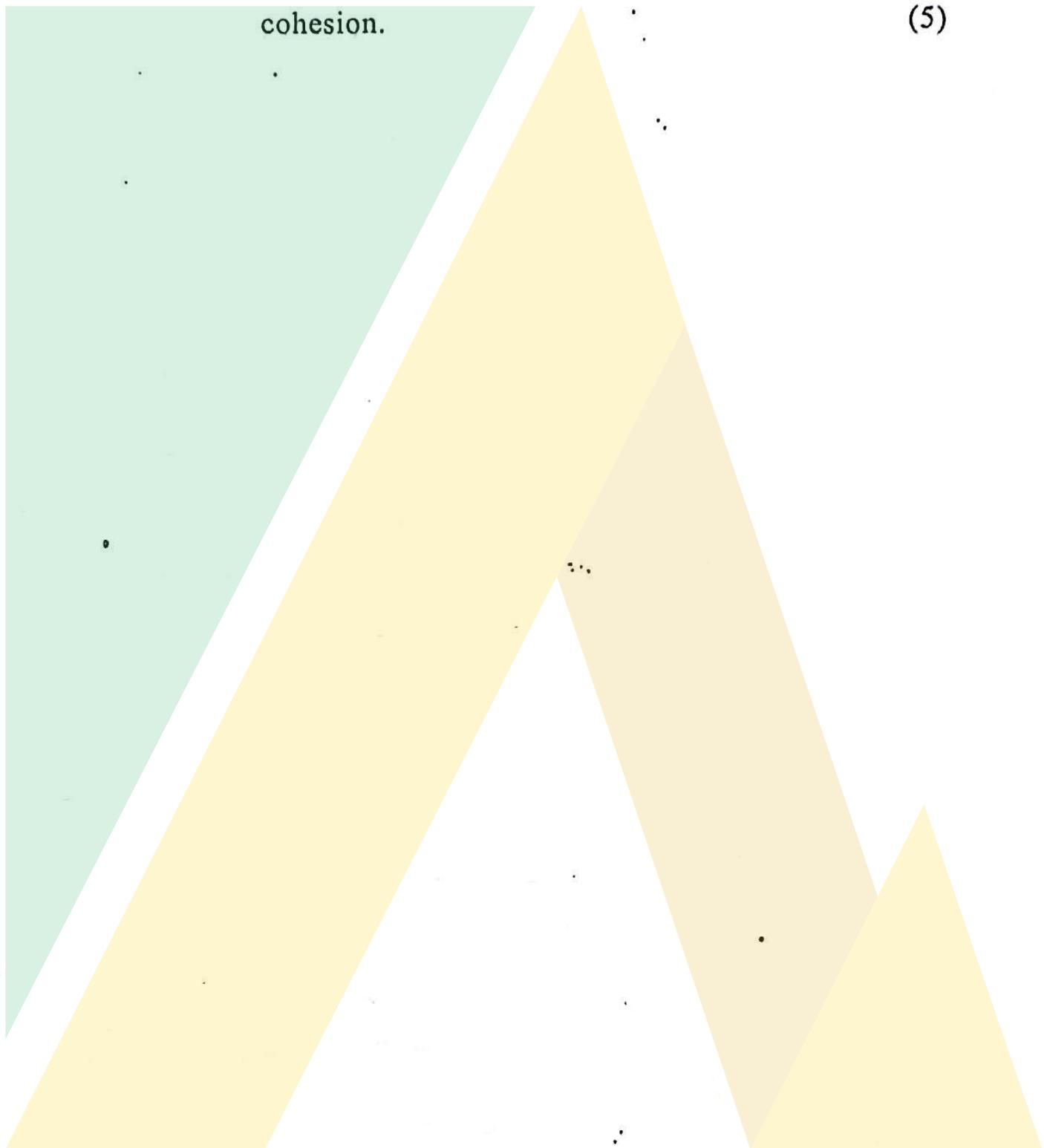
10. (a) Explain the various types of coupling. (5)
- (b) Write short notes on :
- (i) State diagram with the help of diagram
 - (ii) Deployment Diagram with the help of diagram
 - (iii) UML (10)

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(c) What is cohesion? Explain the various types of cohesion. (5)



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END SEMESTER EXAMINATION: JANUARY, 2019

IT301

[ET]

Time: 3 Hrs.

SOFTWARE ENGINEERING

Max Marks: 70

Note: Attempt questions from all sections as directed. Use of Non Programmable calculators is allowed.

Section - A: Attempt any Five questions out of Six. Each question carries 6 marks.

[30 Marks]

- Q1. Discuss how the agile models are able to shorten the software development time and cost? Is it possible to convert prototyping model into agile models? Discuss.
- Q2. Discuss the various parameters on basis of which various software development models could be compared? Compare prototyping, spiral, waterfall and agile models on selected parameters.
- Q3. An application has the following: 10 low external inputs, 12 high external outputs, 20 low internal logical files, 15 high external interface files, 12 average external inquiries, and a value of complexity adjustment factor of 1.10. What are the unadjusted and adjusted function point counts? (Assume the weighting factors)
- Q4. A project size of 200 KLOC is to be developed. Software development team has average experience on similar type of projects. The project schedule is not very tight. Calculate the effort, development time, average staff size and productivity of the project. (Assume weigh factors)
- Q5. Discuss the various approaches for problem solving. Discuss how you will undertake problem solving if similar project is already developed by your team and you are much familiar with it.
- Q6. Suppose that you have to undertake requirement engineering in global environments, separated by global distances. Now explain how will you test efficiency of various requirement gathering techniques and how you will finally collect requirements in global environments?

Section - B: Attempt any two questions out of three. Each question carries 10 marks.

[20 Marks]

- Q7. (a) Discuss the various maintenance models in detail. Discuss the nature of maintenance in agile projects for evolutionary software? (5)
- (b) Consider a program for determining the previous date. Its input is a triple of day, month and year with the values in the range

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1 <= month <= 12

1 <= day <= 31

1900 <= year <= 2025

The possible outputs would be previous date or invalid input date. Design equivalence class tests cases. (5)

Q8. Consider the case of Library Management System. Draw Activity and Sequence diagrams. Discuss why such models are required?

Q9. (a) Write a short note on ISO 9001 models. (5)

(b) Discuss the various debugging tools in detail. How will you compare those models? (5)

Section - C: Compulsory question.

[20 Marks]

Q10. (a) Discuss the difference between reengineering and reverse engineering using suitable example.

Propose suitable model for reverse engineering. (7)

(b) What is information flow model? Discuss the model for suitable example. (5)

(c) Suppose that you are handling the project on 'System for automatic aadhar based driving license handling system' that allows a person to drive without any need for carrying driving license. The police could verify license, pollution and other care details by using adhar number.

For this system, derive the Behavioural and non-behavioral requirements. Also, explain how will analyse the requirements? (8)

[No. of Printed Pages – 4]

IT301

Enrol. No.

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END SEMESTER EXAMINATION : NOV.–DEC., 2021

SOFTWARE ENGINEERING

Time : 3 Hrs.

Maximum Marks : 60

Note: Attempt questions from all sections as directed.

SECTION – A (24 Marks)

Attempt any four questions out of five.

Each question carries 06 marks.

1. Discuss the significance of software quality assurance during software development. Explain the components of McCall Software quality model.
2. A project size of 200KLOC and software development team has average experience on similar type of projects. Calculate the effort, development time, average staff size and productivity of the project.
3. Compare the relative advantages and limitations of the object oriented and function oriented approaches to software design.

P.T.O.

4. Discuss the difference between black-box testing and structural testing and suggest how they can be used together in the defect identification process.
 5. Explain, when do we prepare requirement traceability matrix, is it before test case designing or after test case designing. Also discuss what are the inputs required to prepare the same?

Attempt any two questions out of three.

Each question carries 10 marks.

6. Explain in detail 5 risks involved in development and deployment of an e-commerce project. Identify the personnel who must be involved in the risk analysis of this project and describe their responsibilities. Suggest methodologies to prioritize the risks for managing them. Also, list the strategies to be incorporated to mitigate the identified risks.
 7. What is a software failure? Explain necessary and sufficient conditions for software failure. Mere presence of faults means software failure. Is it true? If not, explain through an example, a situation in which a failure will definitely occur.

8. List five desirable characteristics of a good Software Requirement Specification (SRS) document. Discuss the relative advantages of formal requirement specifications. List the important issues, which an SRS must address.

SECTION – C (16 Marks)
(Compulsory)

9. (a) Draw the Use case diagram for the following case:

There are two actors named student and a teacher. There are total of five use cases that represent the specific functionality of a student management system. Each actor interacts with a particular use case. A student actor can check attendance, timetable as well as test marks on the application or a system. This actor can perform only these interactions with the system even though other use cases are remaining in the system. The second actor named teacher can interact with all the functionalities or use cases of the system. This actor can also update the attendance of a student and marks of the student. These interactions of both student and a teacher actor together sums up the entire student management application. (8)

P.T.O.

(265)

(b) Consider the following program segment :

/*sort of an integer array and sorts it in ascending order*/

1. void sort (int a[], int n) {
2. int i,j;
3. for(i=0;i<n-1;i++)
4. for(i=i+1;j<n;j++)
5. if(a[i]>a[j])
6. {
7. temp=a[i];
8. a[i]=a[j];
9. a[j]=temp;
10. }
11. }

(a) Draw the program graph for the given program segment

(b) Determine the cyclomatic complexity for this program.

(8)