

Nirma University

Institute of Technology

Semester End Examination (RPR), December - 2017

B. Tech. in Information Technology, Semester-VI

IT601 Software Engineering

Roll/
Exam No

Supervisor's initial
with date

Time: 3 Hours

Max Marks: 100

Instructions:

- i) Attempt all questions.
- ii) Figures to the right indicate full marks.
- iii) Draw neat sketches wherever necessary.
- iv) Assume necessary data wherever required.

Q-1 Do as directed

[18]

- A Discuss how the software engineering interlocked with engineering management and technology? (3)
- B "Distributed systems are inherently more scalable than centralised systems", Justify. What are the likely limits on the scalability of the system? (3)
- C Write a set of three non-functional requirements for the ticket issuing system, setting out its expected reliability and its response time. (3)
- D List out the factors have to be taken into account in the design of a menu-based interface for 'walk-up' systems such as bank ATMs? Write a critical commentary on the interface of an ATM that you use. (3)
- E Suggest who might be stakeholders in the university student record system? Explain why it is almost inevitable that the requirements of different stakeholders will conflict in some way? (3)
- F List out the benefits of decomposition, modularity, abstraction and encapsulation in software design? (3)

Q-2 Do as directed

[16]

- A Which process model is most suitable for developing the following applications? Justify your answer. (5)
 - i) Software for cost estimation in a project.
 - ii) A system of financial accounting.
 - iii) A word processing system.
 - iv) Development of a web portal.
 - v) An interpreter for a new language.

- B Illustrate the features of spiral model with the help of its process diagram? How are the risk handled in this model? (5)
- C Draw an activity network diagram using the following details: (6)

Activity	Predecessor	Duration (Days)
A	--	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Identify the critical path and total number of days for project completion. Also calculate the float time for each and every activity.

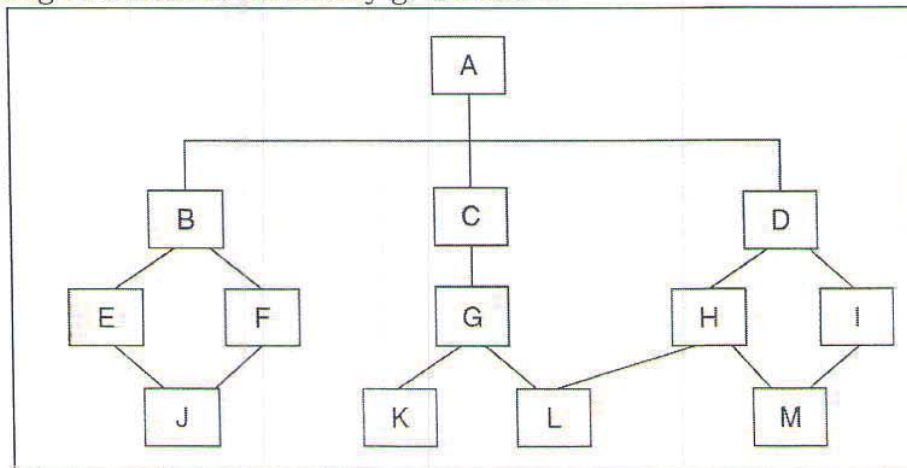
OR

- C Elucidate the advantages of service oriented architecture in software engineering. Discuss the architecture of SOA. (6)

Q-3 Do as directed

[16]

- A Outline Software Myths. Give two examples each for myths and the corresponding realities for Management Myths, Customer Myths and Practitioners Myths. (5)
- B Using the module hierarchy given below: (5)



Identify the orders of module integration for the top-down and bottom-up integration approaches. Estimate the number of stubs and drivers needed for each of the approach.

- C Represent the relationship between external quality attributes and internal quality attributes and how it useful for predicting external software characteristic. (6)

OR

- C Justify your answer for following: (6)
- i. Suggest an appropriate structural model/architectural model for

Online Movie Ticket Booking System.

- ii. Give an example for a system that supports interrupt driven control model.
- iii. Suggest an appropriate control model for a set of software tools that are produced by different vendors, but which must work together.

Q-4 Do as directed

[18]

- A Justify the statement "Verification and Validation both are necessary and complementary". (3)
- B How boundary value analysis is related to equivalence partitioning? Also identify the valid and invalid equivalence classes for one of the fields on a form that contains a text box, which accepts numeric values in the range of 10 to 28. (3)
- C Define the term cohesion in the context of software design? Is it true that in a good design the modules should have low cohesion? Why? (3)
- D Analyze the main advantages of using an object-oriented approach to software design over a function oriented approach. (3)
- E Illustrate with an example about the importance of feasibility study. (3)
- F Mention the various sources from where the test cases can be selected for unit testing. (3)

Q-5 Do as directed.

[16]

- A Explain why program inspection is an effective technique for discovering errors in a program? What types of errors are unlikely to be discovered through inspection? (5)
- B Differentiate between linear life cycle process model and evolutionary life cycle process model. List different process models under the mentioned categories. (5)
- C Analyse the differences between reverse engineering and forward engineering. Explain how cost benefit analysis model results in the decision of performing reengineering or maintenance. (6)

OR

- C Under what circumstance would you recommend the use of staged representation of the CMMI? (6)

Q-6 Do as directed.

[16]

- A "Extreme programming is considered as an example of an agile manifesto", Justify. What are its different practices of development? How are these useful for software development? (5)
- B Write the definitions of Quality Assurance, Quality Planning and Quality Control? Discuss the same in detail with an example. (4)

C Consider the following pseudo code:

```
[0]   begin
[1]   int x, y, power;
[2]   float z;
[3]   input (x, y);
[4]   if (y < 0)
[5]       power = -y;
       else
[6]       power = y;
[7]   z = 1;
[8]   while (power != 0) {
[9]       z = z * x;
[10]      power = power - 1;
       }
[11]  if (y < 0)
[12]      z = 1 / z;
[13]  output(z);
[14]  end
```

Do the following:

- a) Derive the control flow graph for the given pseudo code.
- b) Apply basis path testing to develop test cases that will guarantee that all statements in the program have been tested. Find the cyclomatic complexity and find out the independent paths.

OR

C A colleague who is a very good programmer produces software with a low number of defects but she consistently ignores organizational quality standards. What measures should be taken by the manager in order to maintain the quality standards set by the organization? Also, list possible consequences if no measures are taken. (7)