NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

Diploma in Software Engineering (DSE21.3F/CO) (NIBM-SOC-COM-211-1-2-4-09)
SOFTWARE ENGINEERING
09th September, 2022, 09:00 am - 12:00 pm

Answer all questions.   **(3 Hours 0 Minutes)**

01. (15 Marks)

a) Explain the difference between software and software engineering. (3 marks)

b) Briefly explain the professional and ethical responsibilities of a Software Engineer (3 marks)

c) What is the meaning of 'Software Myths'? (3 marks)

d) Spiral model consists of different phases compared to the waterfall model. What are the situations that the Spiral model used as the software development model? (3 marks)

e) Briefly explain how the Prototype model is different from the waterfall model. (3 marks)

02. (15 Marks)

a) Explain the characteristics to be included in a **good** software product? (3 marks)

b) Explain the difference between 'requirement' and 'requirement engineering. (3 marks)

c) Explain functional, non-functional, and domain requirements with an example for each. (3 marks)

d) Requirement engineering consists of many different tasks. Explain the 'Elicitation task' and the different techniques used in the Elicitation task. (3 marks)

e) Describe what is a software requirement specification (SRS) and write 3 characteristics of an SRS? (3 marks)

03. (15 marks)

a) Briefly explain the importance of Software maintenance. (3 marks)

b) There are different categories of maintenance activities involved with information systems. Briefly explain these maintenance activities. (3 marks)

c) Explain 'Software Reverse engineering' and 'Software Re Engineering' in software development. (3 marks)

d) Explain the term 'Legacy Systems. (3 marks)

04. (20 marks)

"Book World Ltd" wants to develop an online shopping system where a customer should be able to view product information, place an order, view the order form, Reserve an item not in stock and check order status. The customer service officer of "Book World Ltd" should be able to update order status, supply shipping information, and access customer orders, while the purchasing officer should be able to update the inventory. Extend the use case diagram to capture credit card payments and cheque payments of a customer, when placing an order.

You can have suitable assumptions and mention them clearly in the design.
Draw the following UML diagrams.
   a) Use Case diagram with suitable <<include>> and <<extends>> relationships as needed.
      (5 marks)
   b) Class Diagram with suitable attributes, methods, and multiplicity. (10 marks)
   c) Sequence diagram for any selected use case. (5 marks)

05 (20 Marks)

   a) Explain 3 characteristics of "a project" and provide 3 examples for projects. (3 **marks**)
   b) List 3 key Project Management methodologies (3 **marks**)
   c) Briefly compare waterfall & agile methods and recommend the Agile method for a software company with the benefits to the company. (4 **marks**)
   d) List the 4 Agile values in the Agile Manifesto (4 **marks**)
   e) Briefly explain the following.
      i.   Daily scrum meeting
      ii. Product backlog and Spring backlog
      iii. Sprint Planning meeting   (6 **marks**)

06. (15 Marks)

As per the requirement specification, a user account is needed for any user to access his/her online bank account. A user can create an account by providing information to the mandatory text fields First Name, Last Name, Email Id, Password and click on the "Create" button. The Email Id must be unique for each user account that is created. If the Email Id provided while creating the user account is not unique, an error message "Email Id must be unique for the user account. Please try again." must be displayed and the user account must not get created.

Once the user account is created, a user must be able to sign in to the account by providing the Email Id, Password and clicking on the 'Sign In' button.

a) Write three most relevant test cases including all the essential attributes of a test case for the above-stated requirements.   (8 Marks)
b) Briefly explain the difference between Software Quality Assurance and Software Quality Control. (4 Marks)
c) Indicate any two of the testing principles and briefly explain one of those. (3 Marks)