NATIONAL INSTITUTE OF BUSINESS MANAGEMENT

DIPLOMA IN SOFTWARE ENGINEERING – 2018.1F

SOFTWARE ENGINEERING - DSE-2-407

11th October 2018, 09.00a.m. – 12.30 a.m.
Answer All questions.
Time: three and half (3 1/2) hours.

*The marks given in brackets are an **indicative** of the weight given to each part of the question.*

01.

a) Explain the deference between software and software engineering. (03 marks)
b) Describe 3 ethical responsibilities of a software engineer. (03 marks)
c) What are the challenges in software engineering? Explain. (03 marks)
d) Describe the functional, nonfunctional and domain requirements that are used in software development. (03 marks)
e) List and briefly explain any 3 tasks involved in requirement engineering. (03 marks)

(15 Marks)

02.

The purpose of the Green Acres Real Estate system is to assist agents as they sell houses. When a seller contacts the agency, an agent is assigned to help the seller. Information about the houses to be sold and the sellers' details are then recorded.

When a buyer contacts the agency, he or she fills out a buyer request. In every two weeks, the agency sends prospective buyers' details (Buyer's Requirements Statement -BRS) to all the registered Agents along with the 'Available Houses Summary Report'. Periodically, the agent will find a house that satisfies most or all of a specific buyer's requirements as indicated in the BRS. Agent then provide the 'Multiple Listing Statement' (MLS) to the potential buyer through the Agency.

When the buyer selects a house, he or she fills out an 'Offer' that is forwarded through the real estate agency to the seller, who responds with either an offer acceptance or a counteroffer. If the offer is accepted by the seller the status is updated to 'sold' in the Potential Houses file.

At the end of each month Seller registration, Buyer registration and Completed Sales reports are generated for the Agency manager.

a) Identify the systems boundary and draw the context diagram (05 marks)
b) Explode the context diagram to level 1 DFD (06 marks)
c) Draw a level 1 DFD for any one of the above identified main processes. (04 marks)

(15 Marks)

03.

a) One common technique for gathering requirements is to distribute questionnaires. Describe the characteristics of a good questionnaire. (04 marks)
b) Explain briefly the areas to be take in to account when conducting a Feasibility Study. (04 marks)
c) What are the components of a computerized information system (02 marks)

(10 Marks)

04.

a) Briefly explain the performance measurements (03 marks)
b) When data are stored in digital form, they are more vulnerable than when they exist in manual form. There are several different measures that can take to improve the security of an information system. Suggest few mechanisms that can be used to protect an information system? (03 marks)

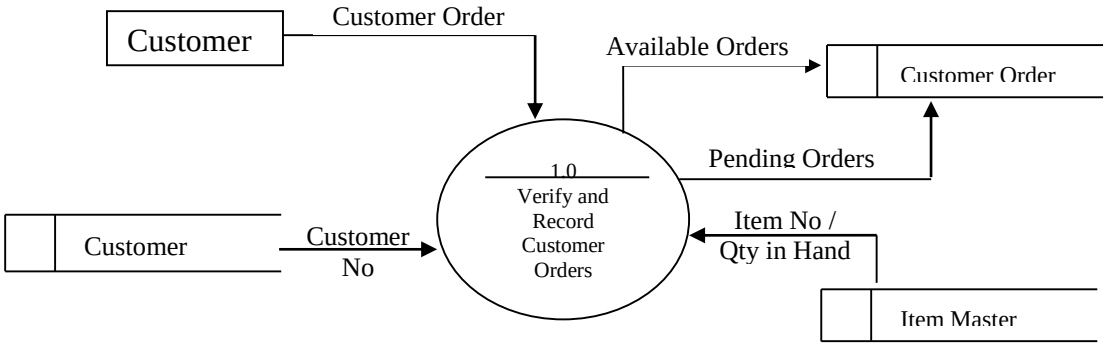
(10 marks)

05.

a) What is software testing ? (02 marks)
b) By conducting a Black Box Testing what are the areas that a Tester attempts to find errors in? (02 marks)
c) Software maintenance in software engineering is the modification of a software product after its delivery. Name and briefly explain the factors that cause the need for software maintenance. (06 marks)

(10 marks)

Questions 6 based on the following diagram



PC Experts maintain an information system to manage their daily orders. System records customer orders against the customer and one customer can place an order for many items at a time. When ever the system receives the order, it is checked against the available items and records the order in the Customer order file with the status pending or available.

06.

a) Design the input layout to accept customer orders (04 marks)
b) Design the data stores to record Customer Details, Item Details and Sales Order Details. (06 marks)

(10 marks)

07.

a) Explain about the importance of configuration management in software development. (03 marks)
b) What do you mean by Agile software development. (03 marks)
c) Describe three key qualities among the people in an Agile team. (03 marks)
d) What is the importance of having scrum meetings. (03 marks)
e) What are the main things to be done in extreme programing (XP). (03 marks)

(15 Marks)

08.

A vending machine sells ready to eat items (chocolate bars, cookies, drinks, etc.). Machine has an id, capacity, total sold quantity, total income as attributes. Each item has a price, quantity and a name as attributes and an item can check for availability and find price of it. A customer can buy an item, using a smart card (issued by the vending machine company) to pay for it. No other payment forms (i.e. cash, credit card) are allowed. The smart card records on it the amount of money available. Vending machine has a smart card reader that can use to read card amount, insert card, update card amount and check card validity.

When a customer wants to buy an item first choose the item and then pay for it. System administrator will setup the machine and an employee will check item availability and reload the machine.

The functions supported by the vending machine are: Sell an item, Recharge the machine, set up the machine, Monitor the machine

Draw following UML diagrams for the above given system description.

a) Use case diagram (05 marks)
b) Class diagram (05 marks)
c) Sequence diagram for Customer successful buying an item using following steps.
Customer chooses an item, the machine find that the item is available, Customer pays for the item, Machine releases the item, Machine releases the card, Customer picks the product and the card (05 marks)

(15 marks)