



**NATIONAL INSTITUTE OF BUSINESS MANAGEMENT**

**Diploma in Software Engineering-16.2P**

---

**Software Engineering- DSE/3/2/3/07**

**Time allowed: Three and half hours      16<sup>th</sup> of December, 2017, 1300pm - 1630pm**

|                                   |
|-----------------------------------|
| <b>INSTRUCTIONS TO CANDIDATES</b> |
|-----------------------------------|

- |  |
|--|
| <ul style="list-style-type: none"><li>• This paper contains 10 questions on 2 pages (2-4).</li><li>• The total marks obtainable for this examination is 100.</li><li>• Marks for each question are indicated</li><li>• This examination accounts 60% for the course assessments.</li><li>• This is a closed book examination.</li><li>• All calculators are not allowed.</li><li>• Answer ALL questions.</li></ul> |
|--|

|                             |
|-----------------------------|
| <b>ADDITIONAL MATERIALS</b> |
|-----------------------------|

- |  |
|--|
| <ul style="list-style-type: none"><li>• None</li></ul> |
|--|

**01.** A grocery store has just implemented a new sales system. When a customer has selected the items for checkout, the item is scanned. The system can identify the item scanned because of its bar code. The system looks up the price of the item from the item master file. Once all items have been identified, a total price is computed and given to the customer with an invoice. Then the inventory and good sold files has to be updated. When an item reaches its reorder level system generates the purchase orders for registered suppliers. The grocery store receives the items with a delivery note. At the end of each month system has to generate Monthly Sales Order report and Monthly Customer Registration Report for the store owner.

- a) Identify the Systems boundary and draw a context-level data flow diagram
- b) Explode the context level diagram in (a) to level 0 DFD
- c) Draw a level 1 DFD for any one of the above identified main processes.

**(15Marks)**

**02.**

- a) Explain the three main objectives of the system design.
- b) Explain Economical Feasibility Study in detail.
- c) What are the techniques that can be used for primary and secondary data collection?

**(08 Marks)**

**03.**

- a) What are the factors that cause the need for system changeability?
- b) How can you improve the performance of a data oriented system?
- c) What are the consequences of high coupling?

**(08 marks)**

**04. AA**

- a) Explain what is Regression Testing with its importance.
- b) Explain the factors that cause the need for system maintenance.
- c) What is a software development life cycle model? Explain the spiral model with its advantages and disadvantages.

**(10 marks)**

#### **Questions 5, 6 and 7 based on the SRS of the Precision Tools (Pvt)Ltd**

**05.** According to the SRS of the Precision Tools (Pvt)Ltd the system should generate monthly Sales Report by Item for the middle managers. As the business analyst of the project your required to design the output layout of the Monthly Sales Report.

**(04 Marks)**

**06.** Precision Tools (Pvt)Ltd generates invoices at each sale. Company sells many items in one invoice and the invoice is generated only if the order status is completed. According to the SRS they wanted record invoice details (To whom the invoice is addresses, Date, Items sold, Quantities of each item, Item Total, Sub Total, Tax/Discount amounts, Invoice total) Item details, Registered Customer Details and Shipping Order details. For each Sales order system generates a shipping order which includes items requested in the sale order, Container Capacity, Packing Method, Name and Address of the Customer. System keeps track of the orders as 'Pending', 'Sent to Where House' and 'Complete' Design the data stores to record above details.

**(10 Marks)**

07. Write a pseudo-code to generate the Monthly Sales Report of the Precision Tools (Pvt)Ltd.  
(10 Marks)
08. Model the logic of the below case study using a decision tree and a decision table
- ABC video shop has two types of customers Regular and Temporary. Regular customers who are registered with the company for more than two years receives a discount of Rs 500/= on all orders. For orders between 1000 -5000 Regular customers receives 2% discount and the temporary customers receive 1% discount. For orders more than 5000 all customers receive 5% discount.  
(10 Marks)
- 09.
- a) Explain the terms validation and verification.
  - b) Name and explain the validation techniques that can be best applied to validate the given fields Identity Card Number, Sales Order Date, ISBN, Districts in Sri Lanka, Invoice Total.
  - c) Find the check digit for the code 56843  
(10 Marks)
10. Read the requirements below and draw requested diagrams in UML to design **Manufacturing Management System**.
- |  |           |
|--|-----------|
| Use case diagram                       | (5 Marks) |
| Class diagram                          | (5 Marks) |
| Sequence diagram for any selected case | (5 Marks) |

### **Functional Requirements**

- The worker produces products for selling. The company has employed several workers and each worker has worker id, worker first name, worker surname, join date and mobile number. Each product has product number, product name. One worker can produce any number of products.
- Workers should be registered in the system by entering details of them.
- Products which are produced by worker received by quality assurance officer.
- The worker is able to add and update product details in the system.
- Quality assurance officers check the quality of each product produced by each worker and records the status. Each officer has officer id, first name, surname, join date and mobile number.
- Each worker and quality assurance officer is given a monthly salary by accountant. Each salary is consisting of basic salary, OT hour charge, number of OT hours and cost of living. Accountant has accountant number, first name and surname.  
(15 Marks)