**Analytical Exercise set on DFD Lecture**

**(This set do not cover th theoretical questions)**

1. Draw the context diagram and a set of data flow diagrams for developing a library management system with the following functionalities. List the assumption made in your analysis.

* Inquiring the availability of a book by giving the ISBN or title or author’s name
* Renting a book that is available
* Returning a book after use
* Reserving a book when it is not available
* Collection of overdue charges
* Maintaining book details
* Maintaining supplier details who supply

1. Assume that you are in charge of designing software to be installed in bank ATM. Draw the DFD of your system.
2. DFD for university admission system.
3. DFD for retail readymade garment store.
4. Draw the Payroll System.
5. Draw the Inventory System.
6. DFD for Hospital Management System.
7. Draw the Finance Accounting System.
8. Assume that you are given the following details of a small mail order catalogue system that allows people to shop from home:

When a Customer receives a catalogue and wants to buy something, he can telephone, fax or email his order to the company. The company gets the order and sends the goods and an invoice. When the customer receives the goods with a delivery note, he sends payment and receives a receipt for payment.

1. Draw the context diagram and the data flow diagrams upto level 2 to analyze the requirement of the system. Also give the data dictionary.
2. Suppose a tic-tac-toe game software has the following features: It first asks the user to enter his name and difficulty level for the game. The user and computer then play alternate moves until the game drawn or won by either. Based on the outcome a congratulatory or conclusion message for the user is displayed. Develop the level 0 and level 1 DFD for the software.
3. Consider the development of the employee management system for an organization. The system is aimed at automating the complete employee details, including maintenance of employee attendance records, leave details and printing monthly pay slips. The system is also expected to sum up each employee’s work hours, time off, shift pays that help to generate the pay slip of employees. Draw the context diagram and data flow diagram for developing the system.
4. Draw a DFD for the following:

Music Course Management system: “A ballet studio receives an inquiry from a customer. A receptionist logs the inquiry into an inquiry file, and forwards the inquiry to the facilities planning department and to the scheduling department. The scheduling department coordinator searches the online course catalog file to find a course description that best matches the customer’s needs. The scheduling coordinator then searches the schedule file to find dates and times for that course. Finally, the scheduling coordinator sends the course description along with scheduled dates and times to the customer.”

1. Draw a DFD for the following:

Gym Management System: “Gym Management System is an easy-to-use gym and health club membership management system. It helps you keep records of your members and their memberships, and allows easy communication between you and your members. Gym Master is also feature-packed, helping you in the management and growth of fitness club.”

* Main Features :
* Member Management
* Payments
* Performance Tracking

1. Draw a DFD for the following:

Online Courier Management System: “Courier Management System is a Windows-based solution specifically designed for the courier and parcel delivery industries. Courier Management System automates the in-field courier process such as, inbound and outbound airway bills, delivery run sheets, accounts receivable and real-time courier tracking. The web-enabled interface allows the user to login from anywhere in the world, and track their courier and also view the customer rate chart. The system is designed to integrate with Financial Accounting, to eliminate duplication of data entry and is also scalable to grow along with your company.”

* Features :
  + Order & dispatch
  + Customer Information
  + Driver management
  + Billing (Using crystal reports)
  + Accounting reports (Using crystal reports)

1. Draw a DFD for the following:

Electronic Device Repair Management System: “An operator receives a request from a customer for repairing of an electronic device through telephone/email. The device is received in the office for repairing by the customer after fixing the date and time through telephone/email. A repair analyst reviews the request and determines the type of repair needed by accessing a repair codes file. The analyst makes an entry of the request in the customer repair order file and forwards a copy to a technician. The technician completes the repair and forwards the order to the quality control department. A quality control analyst tests the customer’s device to verify that the problem has been resolved. The quality control analyst updates the customer repair order file and sends one copy of the invoice/bill to the customer , and a second copy to the head of the quality control department. The customer makes payment by cash/money order or cheque when he is delivered the repaired device by a delivery man.”

1. Read through the following narrative carefully then create a Level 1 Logical Data Flow Diagram.

Electron PH is an organization specializing in supplying electronic components. The success of their business depends on a rapid response to their customer's orders and they are considering the feasibility of updating their current computer system. As a matter of policy Electron PH have no outstanding orders. If parts cannot be delivered when ordered, the order/part order is cancelled and customers must reorder at a later date. Their ordering procedure is as follows:  
Customers place orders by post/telephone/fax/mail. The orders are checked on receipt for the correct name, address and customer's order number. This is carried out using a VDU which queries the customer file to find the Customer's Number. If the order is from new customer, their name and address is added to the customer file and a new customer's number is allocated .As the items ordered are given over the telephone or read from the customer's order form, the stock file is queried to ascertain whether the correct amount of stock is available. If it is, then the item's part number and description are automatically entered into the order shown on the VDU, and the order is then accepted and the invoice is printed together with a delivery note. When the invoice is printed, the system automatically makes an entry in the sales ledger file under the customer's number. As there is only one invoice per order, due to the "no partial order" policy, the invoice number is the same as the order number. The delivery note then sent to the Dispatch Department where the goods are picked and packed and the delivery notes are part of a multipart invoice set. The invoice is sent to the customer by mail

1. A doctors' surgery consists of five doctors a receptionist and a manager. They need an information system to help them to run the facility. A patient may ring the surgery to make an appointment with a doctor. Each patient nominally has a doctor associated with him or her but they may often opt to see any doctor in the surgery that is available. The receptionist sees which doctors are on duty on which days and offers appointment alternatives from which the patient may choose. If an appointment is not available within a short time and the patient must be seen quickly they are asked to attend an emergency surgery that takes place every evening between 5 and 6 p.m. The appointment can be 5, 10 or 20 minutes long, dependent on the reported reason for seeing the doctor. This reason is recorded on the system. Sometimes patients ring to cancel appointments. Appointments may be made for up to six weeks in advance. Appointments that are more than 3 weeks old are automatically deleted from the system. Some appointments are for a doctor to go and visit a patient at home when the patient cannot come to the surgery. Every day one of the doctors is available for home visits in the afternoon. A record is kept of each patient and the treatments they have received for any ailments they may have had. Typically the doctor who sees a patient will want access to this information before deciding on the relevant treatment to give. When the doctor prescribes treatment, details will be recorded in the patient's record.

Repeat prescriptions are automatically produced by the system and are available for collection at the surgery by the patient. At any time a doctor may suspend or cancel the prescriptions.

Patients may register with the surgery providing the number registered to each doctor is not above a certain maximum. Sometimes patients die or leave the area. In this case the patient is removed from the system and their details are archived. The manager is responsible for dealing with this aspect.

* Draw the context diagram for the mentioned scenario.
* Convert the context diagram to data flow diagrams upto level1.

1. "High Tech Computer" receives order from distributors, resellers, and individuals for computers and accessories at a discount, which depends on the size of the order and type of customer. The clerk in charge stores and verifies the order and determines shipment cost. He also identified the type of customer for each order and sends related information to accounting department. An invoice is generated and accounts receivable are processed through the accounting department.
   * 1. Draw the context diagram for the mentioned scenario.
     2. Convert the context diagram to data flow diagrams up to level 2.
2. "Unity Bank Ltd" has computer-based Banking information management system. They have also computer-based human resource management system. Every employee has unique user ID and password and their access of the information systems are controlled using those user ID and pass ord. They offer on-line customer Bank Account opening process. A customer can apply. for bank account from anywhere in the world using web-based interface and submit a]1 the required documents using on-line. To confirm his/her personal in and address the system uses National ID card or TIN certificate and any recent utility bill documents, When all the verification will be completed the customer will received Account opening information. To activate the account number the customer should deposit minimum 1000 taka. After activating account information he or she can apply for Cheque book or ATM card. After getting Cheque book or ATM card he/she can withdraw money from the bank or ATM booth. Every deposit and withdrawn transaction is recorded in a file and the customer can collect the Bank statement from the Bank for a specific period.
   * 1. Design a Data Flow Diagram (DFD) to withdraw money from the Bank using either ATM card or Cheque
3. "BdFashion Ltd." is a fashion wares business company. They have 20 showrooms in Dhaka city and every showroom has several sales persons. They purchase finished dresses of men and women of all ages from different suppliers and sale those items to the registered or non­registered customers. All Purchases are controlled from the head office and distributes items to all showrooms based on their previous sales records. They have discount policy for the registered customers. They have three types of customer: Platinum, Golden and General. If a Platinum customer purchase items by less than 1000 taka then they will get 5 % discount and purchase items by more than or equal 1000 taka they will get 7 % discount. If a Golden customer purchase items by less than 1000 taka they will get 4 % discount and purchase items by more than or equal 1000 taka they will get 6 % discount. General customers will always get 2 % discount whatever they purchase.
   * 1. Draw the DFD for the purchase and sales process of the above business.
4. AZX Videos is the local video store. To borrow Videos or DVEYs, a customer must first apply for a membership card by completing an application form and providing identification. When hiring items, the customer presents the items together with their membership card to the clerk. The clerk then totals their rental. The customer pays the rental and is issued a receipt that includes the return date for the items.Items rented are recorded on the Customers record. If the items are overdue a notice is placed on the customer record and the Customer must pay a late fee the next time they borrow an item. A monthly report, together with the receipts for the daily banking from the store, is sent to the Accounting Department listing the monthly rentals and any late items outstanding.

* Construct a Context Level Diagram for the above.
* Construct Level-1 DFD from your DFD 0.