**ENTITY RELATIONSHIP DIAGRAM EXERCISES**

1. A company has several departments. Each department has a supervisor and atleast one employee. Employees must be assigned to atleast one but possibly more departments. Atleast one employee is assigned to a project but an employee may be on vacation and not assigned to any projects. The important data fields are the names of the departments, projects, supervisors and employees as well as the supervisor and employee number and a unique project number. Draw an ERD to represent the information.
2. A bus company has several buses. It has one garage and covers several routes. At any one time, some buses will be on route while others are in the garage. Individual buses are used on any route and drivers are allocated to any bus. Each route has only one bus travelling on it at any one time. Passengers may have to take more than one bus on a journey. Draw an ERD to represent the information
3. A shipping company is proposing to store information about the voyages made by its ships in a computerised database. Initial system analysis has revealed the following information:

* All ships are identified uniquely by a registration number and have additional properties which include name, tonnage and date commissioned.
* Any ship may sail to any destination during the time for which it is in service with the company. Each destination has a unique destination code.
* Each voyage is assigned to a specified ship. There may be more than one voyage on a particular destination.
* A ship can hold/carry one or more containers each of which is identified by a unique number.
* A container may travel on different ships for different voyages.
* Each container holds one or more shipment and each shipment is assigned to a particular container for tracking purposes, it’s necessary to record the contents of a shipment, the date when a shipment is loaded into a container and the date when it’s unloaded from the container.
* Each shipment is given a unique shipment number and is the responsibility of one shipping agent.
* Shipping agents may be responsible for more than one shipment.

Produce an ERD that accurately models the information listed above.

1. Best television services Ltd rent television sets. Customer book retails through various sales offices with each customer being assigned to a service depot nearest to the customers home address. Each sales office arranges delivery of TV sets for its customers from a designated warehouse, each sales office servicing a number of warehouses. All warehouses carry a complete range of TV models.

* Construct an ERD based upon the above information

**DECISION TABLES EXERCISES**

1. John a student is a student. If it is Saturday, he does not study but goes down town. On other nights when it is raining he goes jogging. On any other night he studies.

Draw a decision table to represent the above information.

1. Harry allows his customers a discount of 5% if both the balance on the account is less than $200 and all items outstanding are less than 2 months old. If one of these conditions is violated, the discount allowed is 2%. Customers who have been trading for more than 3 years are allowed an additional of 2% provided that neither of the above conditions is violated.

Draw a decision table for the above.

1. Three account balances are stored in a computer memory in a random order. The only information available about them is that all the numbers are different. Develop a decision table for the analysis of the process that will allow the computer to print the name and amount of the customer with the highest balance (10 marks)

**DECISION TREES EXERCISES**

* 1. Draw a decision table and a decision tree to represent the following procedure for development of new employees in an organization.

Employees with a relevant degree may either join the graduate entry program or provided they are in the top 15 % in a special altitude test undergo accelerated management training .Those with other degrees are eligible for the graduate entry program and join main intake stream employee’s without any qualification are taken on at clerical grade.

**DATA FLOW DIAGRAM EXERCISES**

1. A small company makes and sells machine tools. The production and accounting system have been computerised for sometime and a system analyst is putting together a proposal to computerise the firms order entry system. The system has been described in narative form as follows.

The order entry process currently begins when the sales department passes an enquiry from a customer to the order department which prepares quotation using the price file and returns the quotation to the sales department. A record of the quoted price is held in the quotation file (The quotation is sent to the customer). A successful quotation result in the customer sending an order to the order department where the order is matched with the quotation.

The order is then given a number and entered onto the order file. The order department uses the details in the order file to create and acknowledgement which is sent to the customer and to compile a works order which is sent to the production department, Produce a context diagram and level 1 DFD for the current order entry system.

1. A purchasing deparment receives a purchase requisition from the stores. The requisition is checked and an invalid requisition is returned to the stores for corrections. An order is made out using a file of approved suppliers and sent to the appropriate supplier .

A copy order is filed. The requisition is also filed.when the goods are received,the invoice is compared with the filed order copy and invalid invoice is returned to the supplier.

Valid invoices are passed to the accounts department for payment and fulfilled orders are filed .

Draw a DFD for the above

1. When an invoice is received from a supplier it’s checked against a file of authorised puechases. If the invoice does not match an aithorised purchase then a querrying letter is prepared and returned back with the invoice to the supplier. If the invoice matches an authorised purchase but it’s for an incorrect amount, then a standard form is completed and returned together with reconciles, a payment authorization is made out. A cheque is prepared and sent to the supplier and the authorisation filed. Draw a DFD for the above.
2. The following narative describes employees recruitment policy in a large establishment for an advertised vacancy.

Applicants are expected to send letters seeking employment to personnel manager at the headquarters. The manager then sorts out the letters based on predetermined qualifications. Rejection letters are sent back to unqualified appilcants. The application letters from qualified applicants are then sent to the recruitment committee for interview.

Applicants who fail the interview are sent letters to that effect. For successful applicants, their document details are sent to the general manager for formalization. The manager sends formal letters of employment offers to the applicants. Letters of acceptance by applicants are received by the general manager’s office. Applicants rejecting employment offers are however required to submit letters to the personnel manager. Draw a DFD for the above policy.

**DATA DICTIONARY EXERCISE**

Represent the following information using appropriate data dictionary notation

1. A TIME WORKED RECORD CONSISTS of the following data elements: EMPLOYEE IDENTIFICATION NUMBER, EMPLOYEE NAME, 1 to 4 occurences of the following

START DATE FOR PAY PERIOD, END DATE FOR PAYING PERIOD, 1 to 7 occurences of the following HOURS WORKED

1. an order consists of the following data elements: ORDER DATE, Only one of the following elements SOCIAL SECURITY NUMBER, CUSTOMER ACCOUNT NUMBER