



INSTITUTE OF TECHNOLOGY TRALEE

Higher Certificate in Computing

STAGE 11

Past Examination Paper Systems Analysis & Design

Question 1:

[40 marks]

Caterpillar Plant Hire is considering implementing a computerised system to handle their scheduling, inventory and accounts records. The following is a description of the system:

Details of all equipment that is available for hire (JCBs, Diggers, loaders, etc.) is recorded in the Equipment file. Each piece of equipment is identified by an equipment ID and has a description and a daily rental rate. The company has the ability to add, amend and print the details of all items in the Equipment file.

The requirements of an incoming job are logged in the Job-waiting file. Each job is assigned a job reference number and may be for a new customer or an existing customer. For new customers, the customer details are recorded in the Customer file. A job is for only one piece of plant equipment but a customer may have several jobs on-going at the same time.

Each morning, the administrator matches a job waiting with the Equipment file. If the required equipment is available, then the job is scheduled to start. In this event, the details of the job (start date, number of days, etc.) are removed from the jobs-waiting file and are recorded in the Schedule File and the Equipment file is updated to reflect that the equipment is out on hire. The customer details remain in the Customer file. The administrator may also check the availability of a particular piece of equipment at any time.

Once a job has been completed and the equipment has been returned to the company, the Equipment file is updated to reflect that the equipment is once again available for hire and the job is flagged as 'completed' in the Schedule file. In addition, an entry detailing the invoice date, job reference, and amount due is made in the Invoices file. Each invoice has a Payment Date, which is blank until a payment is received from the customer.

At the end of each month, an invoice is printed for all unpaid invoices recorded in the Invoice file. The customer details to be printed on an invoice are retrieved from the Customer file and job details from the Schedule file. Each invoice entry has an initial issue number 01. This issue number is incremented each time an invoice is sent for this job.

When a payment is received from a customer, the appropriate record in the Invoice file is updated record the payment date, which reflects that the invoice is paid.

The accounts department may also produce a summary of revenues and outstanding monies whenever required.

- (a) List the elements to be represented on the DFDs **(10 marks)**
- (b) Draw the level-0 DFD for the proposed system. **(5 marks)**
- (c) Draw a level-1 DFD for the proposed system. **(10 marks)**
- (d) Draw any required level-2 DFDs for the proposed system. **(10 marks)**
- (e) Give suitable file structures for the Schedule File and the Invoice File. **(5 marks)**