

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF APPLIED SCIENCE**  
**COMPUTER SCIENCE DEPARTMENT**  
**DECEMBER EXAMINATIONS 2001**

**SUBJECT:** STRUCTURED SYSTEMS ANALYSIS AND DESIGN  
**CODE:** SCS 2104

**INSTRUCTION TO CANDIDATES**

Answer any five questions  
All questions carry equal marks

**Time: 3 hours**

**QUESTION ONE**

- a) Draw a Data Flow diagram for this case:  
Webotronics (Pvt) Ltd uses the following credit-card procedure. The customer presents a credit card to the service station attendant who completes on invoice and gives one copy to the customer. The station manager batches the accumulated invoices together, with an adding machine tape, and sends them to the company's regional office once a week. The company verifies the amounts, credits the station's account with the amount of the batch, and holds the invoices until the end of the month. At the end of the month, the company batches the invoices by customer number, photocopies them, adds the invoices to the customer account tape file, prints the monthly statement, and mails it to the customer with the invoices. On receipt of the payment, the company verifies the amount of the cheque against the payment stub, batches the daily stubs by customer number, and subtracts the payment from the customer account on the tape file. [10]
- b) Prototyping techniques have removed the need for detailed systems analysis.

Discuss this statement by giving your views on the subject and justify these views. [10]

**QUESTION TWO**

- a) i) What is normalisation and what is its purpose. [3]  
ii) Describe the different levels of the Third Normal Form as you normalise the following data:

Doctor No.  
Doctor Name  
Operation No.  
Operation Date  
Operation Time  
Patient No.  
Patient Name  
Date of Admission

[7]

- b) A well conducted feasibility study is an essential pre-requisite to the analysis and design of an effective information system.

Discuss this statement by describing the output of the feasibility study and show how this output is used in the subsequent project for

- a) Control of costs [5]  
b) Systems analysis. [5]

### **QUESTION THREE**

- a) Compare the advantages and disadvantages of the following methods of implementation and give an example of a case in which you would use each method

- i) Parallel running [3]  
ii) Pilar operation [3]  
iii) Direct change-over [3]

- b) Draw a decision tree for the extension of visas. The tourist visa can be extended up to a maximum of 3 months, with each extension for a maximum period of 7 days at one time by the office in villages where there is no immigration office however the applicant must be able to show that he/she has exchanged the equivalent of US\$5 for each day the extension is to run. Visa extensions cost US\$20 for a 1-month extension and US\$10 for a seven day extension. Other periods cost US\$1 per day. A tourist visa can be extended beyond the three months maximum only at the recommendation of the ministry of immigration. [11]

### **QUESTION FOUR**

- a) What are the differences between  
i) Batch processing [4]

- ii) online real time processing [4]
- and
- iii) online with batch processing. [4]

Draw systems flowcharts to support your answers.

- b) In establishing a computer centre what threats to the security of that centre would you anticipate, and what security measures would you put in place to counter these security threats. [8]

#### **QUESTION FIVE**

- a) A company **ZZZ** that is located in a certain city **XXX** has several employed all working under one manager. Each of these persons has been allocated place to live in the different areas of the city where the company's housing estates are located.

Draw an entity-relationship diagram to this problem to enable queries to be made and show the different tables that result. [10]

- c) When doing a cost/benefit analysis, intangible benefits often assume major importance. Discuss three types of intangible benefits and show how efforts can be made to quantify these. [10]

#### **QUESTION SIX**

- a) Draw a JSP diagram to the following problems:

The standard design for a house includes a specification as follows. The front of the house (looking in from left to right) has a large window, which may be Georgian style or a picture window, followed by a door which may not have a glazed upper section. If the door has no glazing it may be painted red or green, glazed doors are always green. After the door (on the right hand side of the house) there are either two small windows or a large window. The document on which this structure is drawn should include a heading. The name of the architect, and the name of the owner of the documents appear at the bottom of the page. [12]

- b) Describe the different careers in systems analysis and design. [8]

**END OF QUESTION PAPER**

~~GOOD LUCK!~~