

Ollscoil na hÉireann, Gaillimh

National University of Ireland, Galway

Semester One Examinations 1999/00

Higher Diploma In Systems Analysis Examination

(Business Systems Development)

Programming Languages I (MS866)

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Time allowed: TWO hours

Candidates should answer *THREE* questions

All questions carry EQUAL marks

Q. 1. A fast-food outlet sells pizza slices (£1.25), fries (£1.00) and soft drinks (£0.75).
You are required to write a program in Visual Basic to calculate a customer's bill.

You should use a subprogram to read in the quantities of each item ordered. The quantities should be read in from text boxes. The quantities should be returned to the calling procedure which then passes them to a function that calculates the total due and returns that to the calling procedure.

The total and quantity of each item purchased should then be passed to a subprogram that should display the total quantity of each item and the total cost in a picture box. A sample output is shown:

Item	Quantity	Price
Pizza Slices	3	£3.75
Fries	4	£4.00
Soft Drinks	5	£3.75
Total		£11.50

(33 marks)

Q. 2. (a). There are two main structures in Visual Basic for handling decisions (i.e. selection structures). Describe, using examples, these structures. **(15 marks)**

(b). A company needs a program to calculate the yearly bonus for each employee. The bonus is determined based on the following:

5% of salary + amounts based on length of service and on job grade. These amounts are calculated as follows:

Length of service (presume service is rounded up to next whole number):

0 – 5 years	£100
6 – 10 years	£200
> 10 years	£300

Job grade:

Grade 1	£75
Grade 2	£100
Grade 3	£125

The salary, length of service and grade should be read in from text boxes and the total bonus displayed in a picture box.

(18 marks)

Q. 3. (a). You are required to write a program in Visual Basic to calculate the salary to be paid to each employee in an organisation. You should read in each employee's name and id number from a sequential file (use a For...Next loop). You should continue reading until the end of the file is reached. As you read in the data for each employee you should ask for the hourly rate and the number of hours worked on each of days 1 to 5 using Input boxes.

Print the name, id number and salary to a picture box, where salary is the hourly rate * the number of hours worked.

(20 marks)

(b). You are required to write a program in Visual Basic that creates a backup file of the employee file described in **(a)** above.

(13 marks)

Q. 4. A program is required by a hospital to create patient bills upon their discharge from hospital.

This program is run on a weekly basis to create bills for all patients discharged in the previous week. The program should continue reading patient details until there are no more records in the patient file.

For each patient the program is required to calculate the accommodation charges. The accommodation charges are £151 per night for a private patient and £20 per night for a public patient. If the patient made use of a theatre, the theatre charges should be calculated. The theatre charges include a facilities charge of £100 for public patients. The facilities charge is £500 for a private patient in addition to a doctor's charge of £200 and an anaesthetist's charge of £300.

The activities detailed above can be grouped into three main functions:

1. CalculateBill
2. CalculateAccommodation
3. CalculateTheatre

The main function, CalculateBill will call the function CalculateAccommodation, and if necessary, CalculateTheatre.

You are required to develop the solution algorithm for the above problem using pseudocode.

(33 marks)

Q.5.(a). User-defined data types (records) provide a convenient way of packaging, as a single unit, several related records of different types. Describe, using examples, user-defined data types. You should consider how they are declared as well as how they are used.

(15 marks)

(b). Write a program in Visual basic to keep track of classrooms and their capacities in a school. You should declare a record with the following elements:

RmNumb	integer
Location	string of 50 characters
Capacity	integer

Declare an array of 50 records and then ask the user to enter in the room details for each room using Input Boxes. You should then print all the room numbers, locations and capacities to a picture box.

(18 marks)