



ICM

MARCH 2016

INFORMATION PROCESSING

Instructions to candidates:

- a) Time allowed: Three hours (plus an extra ten minutes' reading time at the start – do not write anything during this time)
 - b) Answer any FIVE questions
 - c) All questions carry equal marks. Marks for each question are shown in []
 - d) Mark allocations should determine the length and depth of your answer and the time you spend on it. A part question carrying 4 marks normally requires 4 different and valid points
 - e) In definitions, do not use the word being defined in your definition, e.g. avoid the word SERIAL when defining SERIAL FILE
 - f) Ensure that you pay particular attention to words underlined, in CAPITALS or in **bold**. FEW OR NO MARKS will be awarded to any question where these are ignored
 - g) No computer equipment, books or notes may be used in this examination
-
1.
 - a) A LARGE file of fixed length records is created from the data of customer transactions as they are received. This file is then used to update a master file of customer records. Describe the processes, both manual and by the computer program, which occur if the file is organised as:
 - i sequential
 - ii INDEXED sequential [10]
 - b) Distinguish carefully between batch and real-time processing. [4]
 - c) Explain WHY batch processing is considerably less common now than in the past. [6]
 2. Select TWO of the following methods of data capture:
 - a) MICR
 - b) OCR
 - c) OMR
 - d) Barcode readingFor EACH:
 - i state a typical application which uses that method
 - ii describe the format of the data before input
 - iii describe how the appropriate input device works from the computer's point of view
 - iv explain why it is the MOST appropriate method for that particular application [10 each]
 3.
 - a) Give specific BUSINESS examples where EACH of the following validation checks would be used. Include in your answer for EACH:
 - TWO realistic examples of data – one VALID and one INVALID
 - An explanation of how the computer could detect the invalid one
 - i Range check
 - ii Format check
 - iii Presence check
 - iv Any other check (excluding check digit verification) [12]
 - b) Employee numbers are six digits long and are created using the modulo-11 system with traditional weights 6, 5, 4, 3, 2, 1. Investigate the number 354287 and state whether it is valid or not. Show all stages of your working. [6]
 - c) Check digit validation cannot realistically be used for checking all numeric data. Identify a situation where it is appropriate and one in which it is not. [2]

continued overleaf

4. a) Explain why validation is always performed when data is FIRST entered into a computer and identify problems that would occur if this was not the case. [4]
 b) Employee numbers in a company are 5 digits long including the check digit. The normal modulo-11 system has been used with weights of 5-4-3-2-1.
 i Explain the purpose of the check digit. [2]
 ii A pay clerk enters an amendment for employee 72646. Explain how this number can be validated without the need to consult the employee file. Show the checking process that the validation routine would use and state whether this particular number is valid or not. [6]
 c) An employee is required to give the dates of the first and last days of his proposed holiday. EACH date is recorded as three integers (day, month, year). State all the validation that can be performed on these dates alone. General answers about validation will score no marks. [8]

5. A company holds details of all its products on an indexed-sequentially organised file. In a telephone enquiry, a customer asks for details about product 3456. The product file is then accessed directly.
 a) Describe all the internal processes, logical and mechanical, that occur from the moment 3456 is keyed until the details of the product appear on the screen. [10]
 b) Explain why the file is unlikely to be held on CD-ROM. [2]
 c) The file would not be held on magnetic tape. Explain why magnetic tape is still used for other purposes. [3]
 d) Using the following table, add FIVE more fields that you would expect to find on this PRODUCT file. [5]

| Field Name | Datatype | Purpose – how it is used |
|-------------|-----------|---|
| ProductName | Character | Identification and for printing on a customer invoice |

6. a) Data security is of vital interest to any company. Outline the possible effects of a company with inadequate security in its computer system. [4]
 b) A computer system could be vulnerable in a number of ways including:
 • accidental loss of data
 • hardware problems
 • deliberate acts to create problems by staff or other people
 For EACH of these three, discuss possible ways of eliminating or minimising the problem. [16]
7. a) Modern printers can print diagrams with included text. Describe applications from the world of commerce and industry where diagrams are produced and where:
 • a plotter would be MORE appropriate [4]
 • a printer would be MORE appropriate [4]
 Your answers should explain why EACH is more appropriate.
 b) Identify:
 i TWO types of printers which are able to print good quality diagrams
 AND
 ii TWO printers which either cannot print diagrams or the quality is poor [4]
 c) With the aid of a diagram, explain how a plotter is able to print diagrams in different colours and with associated text of different fonts, font sizes and at different inclinations. [8]
8. There are many tasks that a standard operating system undertakes. Name a particular operating system and describe, in detail, FIVE significantly different tasks that it performs. [20]