ICM

DECEMBER 2016

SYSTEMS ANALYSIS

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 sections of questions are shown in [ ]
d) Mark allocation should determine the length of your answer and the time you spend on it. Generally one mark is awarded for every valid point you make
e) Read each question through fully before starting any part of it
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 website allows users to search for homes that meet their specific criteria, e.g. type of property, purchase or rent, location etc.
   a) Use a full page of your answer book to design the layout for the on-screen **search** form. Indicate and explain:
      i which fields (if any) would be **required** (i.e. cannot be left blank)
      ii which fields might have multiple options
      iii what options might be provided on the webpage for users to manage how the results are displayed [10]
   b) Sellers and landlords can apply online to advertise their property to sell or rent. Design the layout for an online form that would capture **all relevant** details to allow a person to promote their property on the website. [10]

2. Draw a **System Flowchart** for the following scenario:

   Course Enrolment System
   Potential students fill in a paper form to enrol on courses at a college. The details from the form are entered into the computer by admin. staff, some fields will need to be validated.

   Candidates will need to provide ID to support their application. This must be checked and verified. If the application is approved the candidate's details will be stored, they will be allocated a unique Student Number and then enrolled on the course they have applied for. The course file is then updated with the student details.

   Some candidates have attended courses previously, therefore their details will already be in the system and they will use their existing student number.

   The course fees are calculated and payments are recorded to the payments file. A receipt is printed for the student. A copy of the student registration form is also printed for the student. [20]

3. In **logical sequence**, discuss the stages of a system life cycle.
   For EACH stage:
   a) clearly explain the purpose
   b) describe how it is carried out
   c) outline the people involved
   d) explain what each person's involvement entails

   You could write your answer in the form of a table with parts a-d as headings. [20]

continued overleaf

4. Modern businesses need to have an up-to-date and efficient computer system in order to keep up with the current market.

A financial advice company employs four consultants who visit clients in their own home to discuss their finances and advise them about loans, investments, mortgages etc. During the visit the consultants fill in relevant paper forms and make notes. This information is strictly confidential and may contain sensitive personal data. The office has two stand-alone computers and one printer/scanner. A consultant will input the information about the clients into a computer at the office and print the relevant documents for filing. You are a systems analyst employed to help this company implement a new computer system. Discuss **in detail**:

a) How you would carry out an **appropriate** investigation in order to determine the needs of this business. What methods would you use? What information do you need? [9]
b) What new hardware would the company need to buy? Justify EACH item that you recommend. [6]
c) What software would they need to ensure that the business was effective, efficient and allows them to remain competitive? Justify your choices. [5]

5. A retail company has a number of applications running on its computer system and is currently computerising a sales and stock control system. Programs are to be written in-house. The company employs over 500 staff. Sales staff deal with postal and telephone orders from customers as well as enquiries.

a) Identify the files that will be needed for this system. For EACH file, state the contents of that file. [8]
b) Discuss how EACH file will be organised and how it will be accessed. Consider the possibility that any file might be accessed in more than one way. Your answer should explain WHY the methods of organisation and access have been chosen. [6]
c) Discuss the security that the systems analyst will build into the system DURING THE DESIGN PROCESS. Ensure you consider how the security procedures he designs are actually implemented. [6]

6. A company is intending to introduce a new computerised application using existing hardware.

a) It could commission specially written programs OR buy an off-the-shelf package. Discuss the advantages and disadvantages of EACH. [8]
b) The company opts for an off-the-shelf package but the system analyst identifies several different packages available for this application. Discuss the factors the analyst would take into account to decide which package to buy.
Identify the TWO most important of these factors, giving your reasons. [8]
c) If the company had developed the programs in-house, it might have opted for PROTOTYPES to be produced. Explain what is meant by the term **prototype** and the advantages that developing prototypes brings. [4]

7. a) RESTART procedures are included in some programs. Explain what these are and why they are necessary. [6]
b) A large international company is heavily dependent upon its computer system.
i Describe the measures that could be taken to prevent fraud related to any financial transactions. [8]
ii Explain the steps the company could take if there was a temporary failure of the system which may take several days to correct. [6]

8. Draw a **Data Flow Diagram** for the following scenario:

- Employees at a manufacturing company are paid each week
- Their working hours are recorded manually on timesheets. The hours consist of standard hours and possibly overtime hours
- The time sheets are collected each week and the details are input into the system
- The data is verified and validated by the accounts department then valid data is written to the payroll transactions file. Invalid entries are output to an error report
- The transactions file is used to update the employee master file, and cheques and payslips are printed
- A payroll summary report is also printed for the accounts department [20]