MARCH 2017

SYSTEMS ANALYSIS
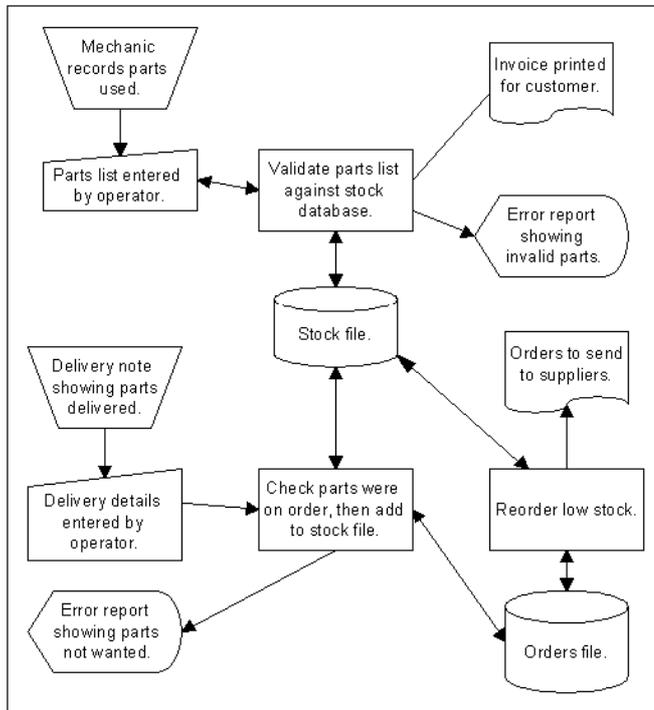
Instructions to candidates:
a) Time allowed: Three hours (plus an extra ten minutes' reading time at the start – do not write anything during this time)
b) Answer any FIVE questions
c) All questions carry equal marks. Marks for sections of questions are shown in [ ]
d) Mark allocation should determine 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) Explain what EACH of the following software acquisition methods are and what is involved:
    i   Purchase and customise standard software
    ii   Develop a database and associated processes
    iii   Commission a software house
    iv   Write in-house programs
    v   Prototyping   [10]
    b) Give ONE advantage and ONE disadvantage of EACH method. **Note**: these should be different examples for each method.   [2 each]

2. a) Draw a diagram that illustrates the stages of the systems life cycle.   [8]
    b) For EACH of the stages you have listed, identify **who** is involved in that stage and **what** their role would be.   [12]

3. A mail order company invoices its account customers. A typical invoice might contain data such as:
    PRODUCT CODE   NUMBER OF ITEMS PURCHASED
        98765   2
        12345   1
    a) Name TWO other necessary items of data enabling the invoice to be sent to a customer.   [2]
    b) Name TWO data items which would be on the invoice but would be generated by the computer. **Note** that the invoices are printed on paper already bearing the company details.   [2]
    c) Design a FULL-SIZED invoice using a full side of your answer book and include the above ordered data items. A perfectly neat invoice is not expected but it must contain sufficient information and have suitable layout to be workable in the real world in order to gain full marks.   [6]
    d) Some customers will not pay within the required time limit. Explain how the company will determine which bills are outstanding.   [5]
    e) The company buys its stock in bulk from suppliers. Add FIVE more fields to the following table for a SUPPLIER file. Each REASON should identify briefly why the data item is needed – how it would be used – what would be the effect if it was NOT present.   [5]

Field name	Data type	Reason for being on the file
SupplierID	Numeric	Unique identifier

4. a) A company sells vacuum cleaners as well as accessories for the vacuum cleaners. There are 50 salespeople in the company who earn commission on the items that they sell. The sale of a vacuum cleaner earns the salesperson 10% commission and the sale of any accessory earns them 20% commission.
   Draw a flow chart to calculate and print the total sale and the total commission for each salesperson. [10]

   b) The following flow chart represents the invoicing system in a car repair garage:

   Describe the whole system and explain the processes that take place. Indicate what are the inputs and outputs and outline the likely contents of the files.
   Note: your answer is to be presented as a narrative (**story**) describing the system – DO NOT simply repeat the wording in the diagram. [10]

5. A **small business** needs to have an up-to-date and efficient computer system in order to keep up with the current market.

   Three brothers, Adam, Benjamin and Charlie, currently own and run a small supermarket (Supermart). Adam is a trained accountant, Benjamin deals with purchasing, suppliers and marketing and Charlie handles sales and staffing. The brothers now intend to open two more stores, each brother will manage his own store but of course they will still work as a team.

   They currently have one stand-alone computer with a printer but these are out of date.

   There are three part-time assistants, all of whom have been employed since the current store opened four years ago. It is hoped that each of these will work full-time – one to stay at the current store and one at each of the new ones.

   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 Supermart 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]

6. The analyst may need to design coding systems for DATA.
   a) Distinguish between data coding and data encryption. [4]
   b) Explain why data is coded. Give THREE advantages of coding data. [4]
   c) Describe THREE different numeric data coding methods. For EACH, select a particular situation where that code would be used, giving and describing a realistic example. [3 each]
   d) Select ONE of these coding systems. Show with particular data how a company which makes and sells clothes to shops might code items within its catalogue. [3]

7.   a)   It is not always possible to be able to input data directly into a computer when the data is first obtained. Then a paper form is usually created to capture the data and it is entered at a later time. Discuss FIVE significantly different factors that a systems analyst would consider in designing such a form. For EACH, state the reason why this is important.   [10]

      b)   In a particular country, money grants from the Business Council are available for new, small businesses to start up. The money comes in the form of loans and is repayable at reasonable rates. There is an upper limit of 10,000.00 (local currency) for the loan and the repayment time is negotiable. People applying for such a grant must first fill in a form.
           Design a form for this purpose. The form should be drawn full size on one side of a sheet of paper. It should provide the Business Council with sufficient information that it can decide to interview the person or reject the application. Underline those sections of the form which are pre-printed.   [10]

8.   Betta Building Co. is a construction company specialising in building new homes. They need a computer system to help them keep track of each project that is carried out. Project managers analyse the work that needs doing, allocate tasks to various members of the construction team and draw up project plans so that each person knows what they should be doing and when. The project manager also has to determine what materials and other specialists are needed for each build so that jobs can be costed effectively. The office manager calculates quotes for each project based on the estimates provided by the project manager. Site managers are given job sheets that they need to fill in to keep track of progress and record materials used. Administration staff in the office generate the job sheets based on information from the project manager. Construction staff fill in timesheets, logging the hours that they work on each job so that their weekly pay can be calculated. The accounts department receives copies of quotes, invoices for materials and services used, copies of job sheets and copies of all timesheets. From this information, final invoices can be generated and printed and also wages can be calculated and wage slips printed.
      Discuss in detail the use of computers and computer-related hardware in a **construction company**. In particular, state the main tasks performed by the computer system. Your answer should also include:
      •   the type and quantity of computer equipment
      •   how and when data is captured
      •   outputs from the system either on paper or screen
      •   particular uses made of the system by different people within the company
      •   details of the files needed, including content, organisation and methods of access   [20]