

ASSOCIATION OF COMPUTER PROFESSIONALS

CERTIFICATE EXAMINATION

SPECIMEN PAPER

INFORMATION TECHNOLOGY FUNDAMENTALS

(TWO AND A HALF HOURS ALLOWED)

You have ten minutes to read through this paper before the start of the examination.

Answer a total of FIVE questions.

Each question carries 20 marks.

1. a. 'A computer is a programmable device which obeys programs in order to process data.' Explain the terms:
 - (1) Hardware.
 - (2) Data.
 - (3) Program.
 - (4) Programmable. [8 Marks]
- b. Most airlines have extensive computer systems. With examples, describe:
 - (1) Some of the tasks carried out by the computer for the airline.
 - (2) The main items of hardware in the computer system.
 - (3) What data is stored on computer files (not how it is stored).
 - (4) The output generated by the computer. [12 Marks]
2. a. Explain the term *Peripheral*. [2 Marks]
- b. For SIX of the following, explain its purpose, give an example of its use, and state whether it is a particular type of peripheral (input or output):
 - (1) CD-ROM.
 - (2) Hard disc drive.
 - (3) Joystick.
 - (4) Keyboard.
 - (5) Kimball tag.
 - (6) Light pen.
 - (7) Plotter. [18 Marks]
3. Various forms of Document Reading are available, for example:
 - (1) Magnetic Ink Character Recognition (MICR).
 - (2) Optical Mark Reading (OMR).
 - (3) Optical Character Recognition (OCR).
 - (4) Page Scanning.For any TWO of these methods:
 - a. Describe the principle by which a document is read.
 - b. Describe briefly an application, showing the type of document and the data which may be read into the computer.
 - c. Suggest ONE advantage and ONE disadvantage (or limitation) of each method of input. [20 Marks]

4. Computer Output on Microfilm (COM) can provide many useful savings for the right type of application.
- With the aid of a diagram, explain how a typical COM system works. (Show the components and describe the steps involved.) [8 Marks]
 - Suggest THREE benefits of using COM. [6 Marks]
 - Suggest TWO possible disadvantages of COM. [4 Marks]
 - Name, and describe briefly, ONE suitable application for COM. [2 Marks]
5. a. Add the two binary integers, showing your working and carry bits:
- 01101100
10011010
- [4 Marks]
- Convert the two binary numbers in a., and their sum, into denary (base ten). [4 Marks]
 - Distinguish between a *Carry Bit* and an *Overflow Bit*. [4 Marks]
 - Construct a truth table having eight rows for the expression:
A AND (B OR C) OR (B AND C)
Comment on the result. [8 Marks]
6. Files may be organised, accessed and processed (updated) in a variety of ways.
- Explain the terms *File Organisation* and *File Access*; distinguish between:
 - Serial organisation and sequential organisation.
 - Serial access and direct access. [6 Marks]
 - Name THREE types of file. Explain the purpose of each type and give an example of its use. [9 Marks]
 - Explain what is meant by *Batch Processing* and *On-line Processing*. Is it reasonable to update serially organised files by these methods? [5 Marks]
7. Computers can transmit data between devices using a variety of methods.
- Explain the terms *Serial* and *Parallel* as related to data transmission. [4 Marks]
 - Explain THREE differences between serial and parallel methods. [6 Marks]
 - A computer needs to transmit data to:
 - a fast laser printer close to the processor.
 - a slow ink jet printer several kilometres from the processor.
 With the aid of a diagram, explain the likely methods of data transmission, showing any special devices needed. Discuss briefly whether it would be possible to operate the fast printer a large distance (several kilometres) from the processor. [10 Marks]
8. Increasing use of Local Area Networks, Wide Area Networks and the Internet has widened the scope of computer applications. The services available on the Internet include the World Wide Web and e-mail.
- Explain each of the terms underlined. [10 Marks]
 - Suggest THREE advantages of using Local Area Networks. [6 Marks]
 - Suggest TWO practical limitations or drawbacks of Internet use. [4 Marks]