



COMPUTER APPRECIATION & APPLICATIONS

December 2018

Time allowed

Three hours

Instructions

- Write the question number next to each answer in your answer booklet.
- You are not required to rewrite the question in your answer booklet.
- Ensure that you pay particular attention to words in **bold**.

Information

- Different questions may carry a different number of marks.
- Marks for each question are shown in [].

Advice

- Read each question carefully before you start to answer it.
- Use the full time permitted and check all your answers.

Materials

- No other computer equipment, notes or books are permitted.
- For those exams for which numeracy skills are required:
 - a) Non-programmable calculators are permitted.
 - b) Data tables are included at the back of the paper.



ANSWER ALL SECTIONS OF QUESTION 1 AND THREE QUESTIONS CHOSEN FROM 2 TO 6

Question 1 carries 40 marks and each other question carries 20 marks

Note carefully that where some questions require details of how hardware or software achieves its task, descriptions of user actions will NOT earn marks

1. (a) Define the following terms:
- (i) Bit
 - (ii) Byte
 - (iii) Protocol
 - (iv) Asynchronous transmission
 - (v) Synchronous transmission [5 marks]
- (b) Provide **two** examples of synchronous transmission and **two** examples of where asynchronous transmission is used. [4 marks]
- (c) Calculate what decimal number the binary number 10101 corresponds to. [2 marks]
- (d) State what decimal number the hexadecimal number 2EA corresponds to. [3 marks]
- (e) Explain why hexadecimal numbers are used so prominently in computing. [2 marks]
- (f) Explain the difference in the raw values that can be recorded between the **digital** recording of a sound compared to an **analogue** version. [2 marks]
- (g) Discuss the advantages and disadvantages of **analogue** and **digital** storage methods. [4 marks]
- (h) The number 101 would have different decimal values depending on the number base it was written in. The list of values shows the result after the number 101 has been converted back to decimal. Identify the correct number base that would have been used to generate the given values.
- Use the letters O for Octal, D for Decimal, H for Hexadecimal or B for Binary when identifying the number base used:
- (i) 257
 - (ii) 101
 - (iii) 5
 - (iv) 65 [4 marks]
- (i) Give **two** examples each of both **volatile storage** and **non-volatile storage**. Explain the difference between the two terms. [8 marks]
- (j) Give **one** example each of the type of data that would be stored on **ROM** and **RAM**. Describe the differences between the two. [4 marks]
- (k) Computers are known to operate with binary. Describe what is meant by the **1's and 0's** at a microscopic level within processors. [2 marks]

2. For a named business:
- (a) Describe the business's **function**. [2 marks]
 - (b) Describe **three** uses of computing within the business and how the use of computers saves time. [6 marks]
 - (c) Describe how internal LAN networks are used within the business. [3 marks]
 - (d) Explain the importance in the business of having internet access. [3 marks]
 - (e) Many businesses invest heavily in cyber security. Evaluate whether this particular business you have chosen would need to do the same. [6 marks]
- 3.
- (a) Explain the meaning of the terms **logical files** and **physical files**. [2 marks]
 - (b) Define and provide an example of **each**:
 - (i) Character
 - (ii) Field
 - (iii) Record
 - (iv) File [9 marks]
 - (c) Describe what is meant by the **volatility** of a file and explain what is meant by the terms **static** and **semi-static**. [4 marks]
 - (d) Define the term **scratch file** and explain why scratch files exist. [3 marks]
 - (e) Distinguish between the terms **serial-access** and **direct-access** when referring to file access. [2 marks]
4. Give a full overview of a typical Database Management System (DBMS), including maintaining the data, the function of providing security, interface with users, etc. [20 marks]
- 5.
- (a) Define the following terms related to object oriented programming:
 - (i) Class
 - (ii) Object
 - (iii) Inheritance
 - (iv) Polymorphism
 - (v) Encapsulation [10 marks]
 - (b) State and explain the **three** main stages that a compiler passes through during the compilation process. [6 marks]
 - (c) Math.Sqrt() is an example of a function provided by a standard library in a high level language.
For a **named** high-level language, name **two** other standard library functions.
For each:
 - give a single program statement which includes the function
 - state what that example achieves [4 marks]

6. (a) As computers were introduced into businesses there were many concerns that computers would cause massive job losses, as computers would be able to perform tedious repetitive tasks more efficiently than any human. Do you agree with this sentiment? Discuss both sides of the argument and justify your opinion. [8 marks]
- (b) Define the term **multiplexing** and explain why it is such an important technology in the broadcasting and communications industry. [4 marks]
- (c) Describe the main difference between **Time Division Multiplexing** and **Frequency Division Multiplexing**. [2 marks]
- (d) Define the following terms related to data transmission:
- (i) Simplex
 - (ii) Half-duplex
 - (iii) Duplex [4 marks]
- (e) State **two** functions that a programmer is expected to perform. [2 marks]

END OF QUESTIONS