# INFORMATION TECHNOLOGY

*Time allowed: 1½ hours*

Answer **TWO** questions. Each question answered will be worth 50 marks.

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1.
a) Computers fundamentally operate using the binary digits 0 and 1, while humans generally use decimal in everyday life. Often, programmers will consider numbers as hexadecimal.
   What are hexadecimal and binary, and why do programmers often use hexadecimal rather than decimal?

[8 marks]

b) Convert the 16 bit binary number 01010010 11010111 to:
   i)   Hexadecimal
   ii)  Decimal
   You should show your working.

[10 marks]

c) Explain how the different number bases used in IT affect consumers with respect to the storage sizes of IT products such as pen drives and RAM.

[7 marks]

d) Boolean operators are fundamental to many strands of IT. Explain the behaviours of the binary Boolean operators NAND, XOR and AND.

[9 marks]

e) How do the Boolean AND and OR operators compare to their natural language equivalents?

[5 marks]

f) Describe the behaviour of the unary Boolean operator NOT

[3 marks]

g) Many programming and search related tasks require that Boolean operators be combined in more complex expressions. Create a truth table that describes:

   A AND NOT (B XOR C)

[8 marks]

2

a) The following types of software packages are commonly used in businesses:
- Databases
- Spreadsheets
- Web browsers

Name *two* programs that perform each of the above tasks.

[12 marks]

b) A friend suggests that Spreadsheets and Databases are now both so powerful that they can be used interchangeably. Discuss the arguments for and against this statement.

[20 marks]

c) What are the advantages and disadvantages of using an online spreadsheet software when compared to locally installed spreadsheet software.

[18 marks]

3)

a) Describe the characteristics and relative advantages of networked and stand-alone computers.                                                                 [8 marks]

b) What is the Internet? Describe 4 ways in which an organization could use the Internet.                                                                            [16 marks]

c) What is FTP? Explain what it is used for, and the similarities and differences between FTP and email?                                                         [12 marks]

d) Discuss the ways that mobile devices and 'voice based intelligent personal assistants' (such as Amazon's Alexa) are changing how people search for information, and what this means for the more traditional ways of using search engines.  Consider whether there are any privacy implications due to this change.

[14 marks]