M09/3/ITGSX/BP1/ENG/TZ0/XX/M+

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MARKSCHEME

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INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

Higher and Standard Level

Paper 1

8 pages

Examiners should be aware that in some cases, candidates may take a different approach, which if appropriate should be rewarded. If in doubt check with your Team Leader.

In the case of an "identify" question read all answers and mark positively up to the maximum marks. Disregard incorrect answers. In the case of a "describe" question, which asks for a certain number of facts *e.g.* "describe two kinds", mark the **first two** correct answers. This could include two descriptions, one description and one identification, or two identifications.

1. (a) Identify the *two* functions used in this spreadsheet. ***[2 marks]***

- SUM
- VLOOKUP.

[1 mark] *for each point up to a maximum of* ***[2 marks]****.*

(b) (i) Cell D12 contains the expression (D2:D10). Describe the meaning of the information in this expression. ***[2 marks]***

- range
- the contents of all the cells
- from D2 to D10.

[1 mark] *for any two of the above points up to a maximum of* ***[2 marks]****.*

(ii) Cell D13 contains an absolute and a relative cell reference. Define the term *absolute cell reference*. ***[2 marks]***

- a cell reference that does not change
- it prevents changes if the cell is copied
- it prevents changes if the contents of the cell are moved
- any reference to method used such as dollar sign or named cell.

[1 mark] *for any two of the above points up to a maximum of* ***[2 marks]****.*

(c) Explain how features of a spreadsheet can be used in order to investigate "what-if" questions. ***[4 marks]***

Answers may include:

- use of formulae can establish relationships
- use of variables to hold different data items
- instant recalculation
- a scenario can be modelled
- consequences of actions can be predicted
- goal seeking can be used to determine the variable values needed for a desired result
- example of a suitable scenario described.

[1 mark]
A limited response that indicates very little understanding of the topic.

[2–3 marks]
A reasonable description, although the answer may lack appropriate reasoning at the bottom end of the band.

[4 marks]
A clear, detailed explanation of the issue with reasons.

2. (a) HTTP stands for Hyper Text Transfer Protocol. Define the term *protocol* in this context. ***[2 marks]***

- a set of rules/standards
- determines how the data is to be transmitted/transferred
- establishes connection with server.

[1 mark] *for any two of the above points up to a maximum of* ***[2 marks]****.*

(b) Describe how the search engine determines relevant advertisements to display on this or other web sites. ***[4 marks]***

- uses algorithm(s)
- web site words (content) scanned
- HTML scanned
- meta tags scanned
- words looked up in database
- words used as search keys
- in database of advertisements
- system for matching with advertisement
- suitable advertisements selected
- advertisements copied into web page.

[1 mark] *for any of the above points up to a maximum of* ***[4 marks]****.*

(c) Explain *two* ways in which the number of visitors to this or other web sites can be increased. ***[4 marks]***

Answers may include:

- make sure that relevant key words are used
- create links to other web sites
- use meta tags
- pay search engine provider to improve page ranking
- advertise his own web site/examples of where advertisements might be placed
- ensure that the web site has unique selling points
- build valuable content on to web site to encourage traffic.

[1 mark]
A limited response that indicates very little understanding of the topic.

[2–3 marks]
A reasonable description, although the answer may lack appropriate reasoning at the bottom end of the band.

[4 marks]
A clear, detailed explanation of the issue with reasons.

3. (a) The RFID readers have a short range of 0-8 centimetres. Identify *two* reasons why the range needs to be short. ***[2 marks]***

- to avoid cards being read by accident
- avoid charging passers-by (a consequence).

[1 mark] *for any two of the above points up to a maximum of* ***[2 marks]***.

(b) Identify *four* possible tasks the *Oyster* software would need to perform when an *Oyster* card is used at a station. ***[4 marks]***

- read the number / scans card
- read the amount of money on the card
- check it is valid
- record entry (place/time)
- record exit (place/time)
- record journey details
- access database
- check that there is enough money for a journey on the card
- if OK, open barrier
- deduct money for journey
- monitor daily cap
- add money to card if topped up online
- write new amount back to card.

[1 mark] *for any of the above points up to a maximum of* ***[4 marks]***.
Reward any other reasonable tasks performed by the software – consult team leader first.

(c) Explain *one* benefit and *one* drawback of extending the use of the *Oyster* card nationally. ***[4 marks]***

Answers may include:

Drawbacks

- different operators may have incompatible computer systems
- different operators may wish to set their own fares/have different pricing policies
- issues of scale may make changes necessary to the IT systems
- cost of introducing the technology
- worries over privacy/examples of this
- worries over fraud.

Benefits

- easier to plan travel nationally/across UK
- more flexible travel nationally/across UK
- may be able to use technology to pay for other goods/services.

N.B. *Do not accept answers that relate to the general use of the Oyster card. The question relates to extending its use.*

[1 mark]

A limited response that indicates very little understanding of the topic.

[2–3 marks]

A reasonable description, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.

[4 marks]

A clear, detailed and balanced explanation of the issue.

4. (a) Define the term *artificial intelligence*. ***[2 marks]***

- computer based system / algorithm (must be obvious that it is a computer system)
- perceives its environment
- simulates human intelligence (not "thought")
- takes actions as a result of these perceptions to maximize chances of success/solves problems/learning.

[1 mark] *for any two of the above points up to a maximum of* ***[2 marks]****.*

(b) Describe how tests can be used to determine whether a computer system is an example of artificial intelligence. ***[4 marks]***

Answers may include:
- Turing Test (named)
- computer pretends to be a human
- attempt to convince a knowledgeable human
- no visual contact / only uses text/other neutral output
- compare response of machine with response of a human
- judged AI (Artificial Intelligence) if indistinguishable.

[1 mark] *for any four of the above points up to a maximum of* ***[4 marks]****.*

(c) The teacher marking this assignment was suspicious that the poem was not the student's work. The student admitted that it was generated by a computer. Explain how a computer program could have generated this poem. ***[4 marks]***

Answers may include:
- the computer program that produced this "poem" took many pre-existing poems as input
- user inputs words
- dissected them into groups of words
- the word blocks were rearranged
- algorithm for rearrangement
- such as probabilities of words coming together in natural language
- randomness built in
- randomness used to create new content.

[1 mark]
A limited response that indicates very little understanding of the topic.

[2–3 marks]
A reasonable description, although the answer may lack appropriate reasoning at the bottom end of the band.

[4 marks]
A clear, detailed explanation of the issue with reasons.