



MARKSCHEME

November 2007

INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY

Higher and Standard Level

Paper 1

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1. (a) **The credit card number 1325657498570988 is entered by a customer. Identify *two* validation checks that can be performed on this number.** [2 marks]

Answers may include:

- length check
- must be 16 digits
- type check
- must only contain numbers/no letters
- check digit
- extra number added by means of a calculation/algorithm
- presence check / something must be entered in the field
- range check
- look up allowable numbers / check against expiry date for a match (not check expiry date on its own – Q. refers to card number).

Reject checks other than on card **number**.

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

- (b) **Describe *two* ways that a customer can be sure that the credit card transaction is secure.** [4 marks]

Answers may include:

- https – secure web site/protocol plus comment such as denotes encryption used
- padlock icon – denotes secure site/encryption used plus comment such as lock is closed
- verification service used/Verisign *etc.* – plus comment such as therefore site has been declared trustworthy by verification organisation
- SSL used – secure sockets layer – plus comment such as secure protocol
- some form of electronic feedback/email, plus comment such as confirms correct transaction
- install anti spyware software, plus comment such as alerts user/protects against captured keystrokes.

Reject any comments about reputation of the company as it may be a phony site.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

[1 mark] for each way identified up to a maximum of [2 marks], plus an additional [1 mark] for the relevant description / comment up to a maximum of [2 marks].

(c) **Explain why a customer might prefer to book theatre tickets online.**

[4 marks]

Answers may include:

There is no need to go to the box office to book. No need to wait in queues on the telephone. Can see graphically which seats are available and also the prices. There are links to related events that may be of interest. There is online help if there are any difficulties. Can see at any time which tickets have been purchased.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

[1 mark]

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

[2-3 marks]

A reasonable description of the advantages of online booking, plus some comment on why this may be preferred to other methods, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band

[4 marks]

A clear, detailed and balanced description of why online booking may be preferred plus relevant and practical comparisons with other methods.

2. (a) **Define the term *data compression*.** **[2 marks]**

Answers may include:

- amount of data stored is reduced
- resulting in smaller file size
- reduces download times
- some information/quality is lost/removed.

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

- (b) **Describe the process of digitising an image.** **[4 marks]**

Answers may include:

- image is scanned / camera used
- ref to charge coupled device (CCD) / complementary metal oxide semiconductor (CMOS)
- parts of image are sampled
- converted to a set of dots/pixels
- intensity / colour is converted to a number
- the numbers are stored
- as a set of bits.

No marks for quoting names of file formats.

No marks for comments about resolution.

No marks for processes that occur after digitising such as downloading to computer.

[1 mark] for each point up to a maximum of **[4 marks]**.

- (c) **Explain why data compression is used when transferring a movie to a DVD.**

[4 marks]

Answers may include:

Movies are made up of images. Each image contains a lot of data possibly over 1 MB in each frame. Many images, therefore, multiplies data storage requirements. Sound also takes a lot of storage. DVD has limited capacity. Compression allows some of the data to be ignored/not stored. Compression allows more data to fit into limited storage space. Therefore a film can be stored on a DVD that would not fit if not compressed.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

[1 mark]

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

[2-3 marks]

A reasonable description of compression, including some comment on technical issues, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.

[4 marks]

A clear, detailed and balanced description of compression plus relevant and practical coverage of some technical details.

3. (a) Identify *two* coding systems used to store characters in computer files. [2 marks]

- ASCII (American Standard Code for Information Interchange)
- Unicode
- EBCDIC (Extended Binary Coded Decimal Interchange Code)

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

(b) Describe *two* ways that a Rich Text Format (RTF) file differs from a text file. [4 marks]

Answers may include:

RTF:

- RTF file displays Greek / formatting properly
- RTF file contains embedded codes
- RTF embedded codes control the display of the characters
- RTF uses Unicode characters
- RTF provides full language support
- RTF uses 16 bit characters
- RTF files are larger than text files
- some example given of formatting *e.g.* bold
- RTF files can contain pictures.

Text:

- text file only displays plain text / formatting not shown
- text file only contains ASCII characters / does not contain formatting codes
- text file uses 7 bit characters
- text file can only make use of 125 different characters
- text file displays English characters only.

[1 mark] for a basic point about RTF files with an additional [1 mark] for a fuller description.

[1 mark] for a basic point about Text files with an additional [1 mark] for a fuller description.

If candidate makes comments about RTF / Text which obviously contrast with other type, allow credit – no need explicitly to highlight each one.

- (c) **Explain why the PDF format is often chosen to send documents between computers.**

[4 marks]

Answers may include:

PDF is portable document format developed by the Adobe company. It is commonly used to display documents on web sites and to transmit documents in emails. It is a page description format so the document will be viewed exactly as it was created. Languages are not a problem because images are sent. Illustrations are saved in the same way. PDF documents are usually non-editable so they can be used where it is important that no changes are made such as in legal documents. PDF documents can be more secure than word processed files. PDF documents can be read by any computer that has access to a PDF reader such as Acrobat, which is widely available free of charge.

Examiners should be aware that candidates may take a different approach, which, if appropriate, should be rewarded.

[1 mark]

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

[2-3 marks]

A reasonable description of PDF, plus some comment about why it is used, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.

[4 marks]

A clear, detailed and balanced description of the advantages of using PDF plus relevant and practical coverage of some technical details.

4. (a) **Define the term *computer model*.** **[2 marks]**

Answers may include:

- computer program
- based on mathematical relationships / variables
- representation of reality
- a simulation
- used for predictions.

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

- (b) **Describe *two* inputs into the model that would be needed in order to calculate the best number of checkout operators.** **[4 marks]**

Answers may include:

- number of checkouts open
- used to calculate throughput relative to number of customers

- number of people in a/each queue
- this will determine waiting time.

(Do not allow vague statements such as “number of customers”.)

- time waited by individual
- this will affect how many customers do not revisit.

- (average) time individuals are prepared to wait
- this will vary greatly between individuals.

- date/time
- there will be regular busy and slack periods.

- (average) number of items purchased
- this will affect serving time.

- amount spent by each customer
- affects profitability of opening more checkouts

- (average) scan speed of operator / items scanned per unit time
- this will determine how fast each customer is served.

Inputs refer to data items, not devices.

[1 mark] for each input identified up to a maximum of [2 marks], plus an additional [1 mark] for the relevant description up to a maximum of [2 marks].

- (c) **Explain why this or any other computer model may not give accurate results.**

[4 marks]

Answers may include:

There will always be errors because the numbers of shoppers will to some extent, be unpredictable. The numbers may be counted incorrectly. The wrong data may be entered. The model may not take enough variables into account. The model may be incorrectly constructed. Various unpredictable extraneous factors may have an affect.

[1 mark]

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

[2-3 marks]

A reasonable description of how errors may occur in the model, plus some comment about why it has defects, although the answer may be unbalanced and lack appropriate reasoning at the bottom end of the band.

[4 marks]

A clear, detailed and balanced description of how errors may occur in the model including comments on the data and the model itself.
