

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge Ordinary Level

## **MARK SCHEME for the October/November 2015 series**

### **2210 COMPUTER SCIENCE**

**2210/12**

Paper 1, maximum raw mark 75

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1 1 mark for each risk + 1 mark for corresponding reason why it is a risk and 1 mark for method of minimisation

**Risk:** hacking  
**Reason:** illegal/unauthorised access to data  
deletion/amendment of data

**Minimised:** use of passwords/user ids  
use of firewalls  
encrypt data/encryption

**Risk:** virus  
**Reason:** can corrupt/delete data  
cause computer to crash/run slow  
can fill up hard drive with data

**Minimised:** use of /run anti-virus (software)  
do not download software or data from unknown sources

**Risk:** spyware/key logging (software)  
**Reason:** can read key presses/files/monitors on a user's computer

**Minimised:** use of /run anti-spyware (software)  
use data entry methods such as drop-down boxes to minimise risk

**Risk:** phishing  
**Reason:** link/attachments takes user to fake/bogus website  
website obtains personal/financial data

**Minimised:** do not open/click emails/attachments from unknown sources  
some firewalls can detect fake/bogus websites

**Risk:** pharming  
**Reason:** redirects user to fake/bogus website  
redirection obtains personal/financial data

**Minimised:** only trust secure websites, e.g. look for https  
check the URL matches the intended site

**Risk:** credit card fraud/identity theft  
**Reason:** loss of money due to misuse of card/stealing data

**Minimised:** set passwords  
encrypt data/encryption

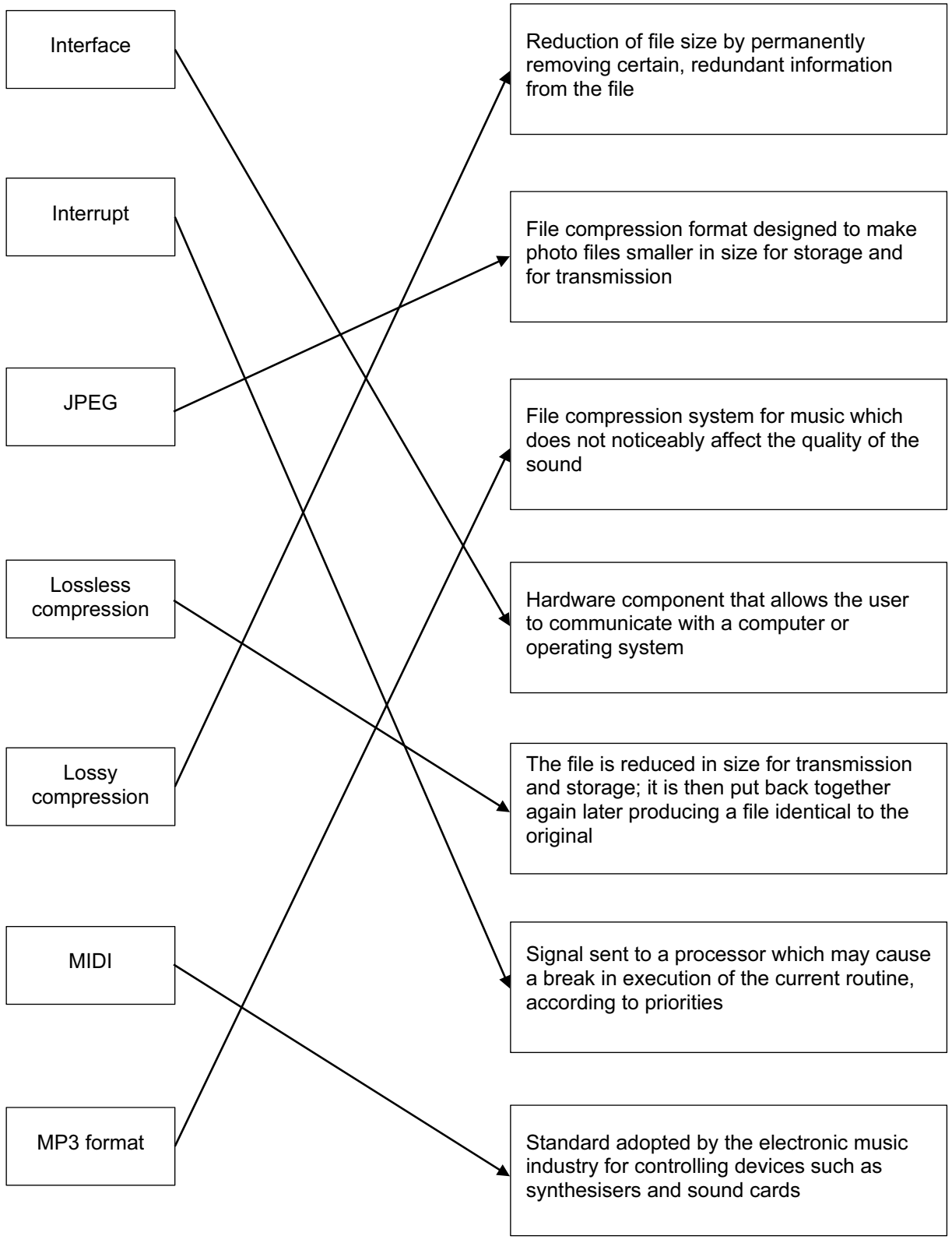
**Risk:** cracking  
**Reason:** illegal/unauthorised access to data

**Minimised:** setting strong passwords  
encrypt data/encryption

There may be other valid answers given that are outside the provided mark scheme.

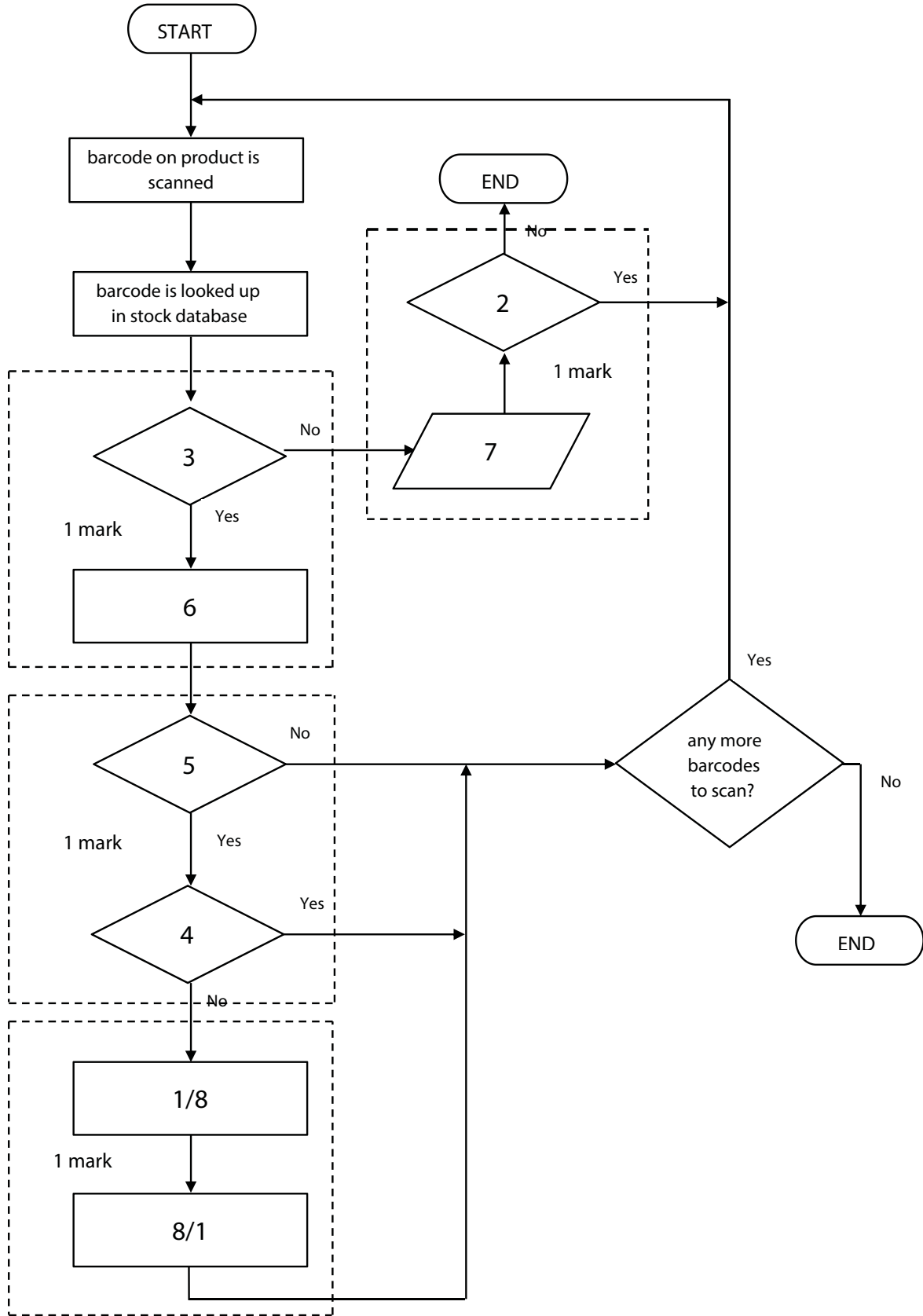
[9]

2



[6]

3



[4]

4 (a) (i) For each hex number, 2 marks if all correct, 1 mark for 2 correct conversions

F A 7:

1	1	1	1		1	0	1	0		0	1	1	1
---	---	---	---	--	---	---	---	---	--	---	---	---	---

D 3 E:

1	1	0	1		0	0	1	1		1	1	1	0
---	---	---	---	--	---	---	---	---	--	---	---	---	---

[4]

(ii) 2 marks if all correct, 1 mark for 2 correct conversions – Follow through

1	1	0	1		0	0	1	0		0	1	1	0
---	---	---	---	--	---	---	---	---	--	---	---	---	---

[2]

(iii) 2 marks if all correct, 1 mark for 2 correct conversions – Follow through  
D 2 6

[2]

(b) (i) (X) FF FF 00

(Y) FF 00 FF

(Z) 00 FF FF

[3]

(ii) – hex values between 0 to F are combined together to create a hex code  
– different combinations in hex codes will create different shades/tones/colours

[2]

(c) (i) First six digits: manufacturer code/manufacturer ID

Last six digits: serial number/serial ID of device/product

[2]

(ii) Allows all devices to be uniquely identified

[1]

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5 (a) Any **five** from:

- naming a suitable sensor, e.g infra-red, pressure, motion sensors, send signal/data to microprocessor
- signal/data is converted to digital (using an ADC)
- microprocessor instructs/send signals to camera to capture image/video
- captured image/video data sent to microprocessor

**either**

- microprocessor compares the image/video with stored images/video...
- ... if person detected = stored image ...
- ...alert given to signal a person has been identified

**or**

- microprocessor compares the biometric data from an image/video with stored biometric data for images/video ...
- ... if biometric data matched = stored data ...
- ... alert given to signal a person has been identified

- Continual/repeated process [5]

(b) 1 mark for correct calculation, 1 mark for correct answer

- number of photos =  $12 \times 60 \times 24 = 17\,280$
- memory requirement =  $17\,280/1024 = 16.9$  (**16.875**)
- ( $17\,280/1000 = 17.28/17.3$  is acceptable) [2]

(c) Any **two** from:

- (data transmission) is faster
- more secure/safer (because it is a dedicated line)
- (fibre optic transmission) is more reliable [2]

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- 6 (a) Any **three** from:
- hypertext mark-up language
  - used to create/develop/author webpages
  - translated by a browser to display webpages
  - uses (opening and closing) tags to display/format content
- [3]

- (b) **Structure:**
- instructs how the layout of the content is displayed

**Presentation:**

- instructs how the content will be formatted e.g. colour/style/CSS
- [2]

- (c) Any **three** from:
- displays web page
  - interprets/translates the HTML document
  - interprets/translates embedded scripting, for example JavaScript
  - provides functions, such as bookmarks and history
  - identifies protocols, such as https, SSL
- [3]

- 7 (a) (i) 1 mark for correct check digit and 1 mark for showing the calculation

$$(4 \times 1) + (2 \times 2) + (4 \times 3) + (1 \times 4) + (5 \times 5) + (0 \times 6) + (8 \times 7)$$

$$= 4 + 4 + 12 + 4 + 25 + 0 + 56 = 105$$

$$105/11 = 9 \text{ remainder } 6$$

check digit is: **6**

[2]

- (ii) **1 mark**
- No/incorrect check digit

**2 marks**

- Total is 78
  - 78/11 ...
  - ... gives 7 remainder 1
  - check digit should be 1
- [3]

(b) (i) 1 mark for each correct parity bit

parity bit

<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>
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parity bit

<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
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[2]

(ii) Any **one** from:

- an even number of digits are changed
- a transposition error(s) has occurred

[1]

8 1 mark for each step in correct order. (NOTE: Marks can be awarded for a correct sequence.)

<b>Steps in the printing process</b>	<b>Step order</b>
As the printing drum rotates, a laser scans across it; this removes the positive charge in certain areas	<b>4</b>
The printing drum is coated in positively-charged toner; this then sticks to the negatively-charged parts of the printing drum	<b>6</b>
The paper goes through a fuser which melts the toner so it fixes permanently to the paper	<b>9</b>
The printer driver ensures that the data is in a format that the laser printer can understand	<b>(1)</b>
A negatively-charged sheet of paper is then rolled over the printing drum	<b>7</b>
Data is then sent to the laser printer and stored temporarily in the printer buffer	<b>2</b>
The toner on the printing drum is now transferred to the paper to reproduce the required text and images	<b>8</b>
The printing drum is given a positive charge	<b>3</b>
Negatively-charged areas are then produced on the printing drum; these match exactly with the text and images to be printed	<b>5</b>

[8]



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**9 (a) RAM**

- contains instructions/program/data currently in use

**ROM**

any **one** from:

- contains the start-up/bootstrap program
- contains/stores the setting for frequency (can't be changed)

**Solid state drive**

- stores the instructions/program/data (to operate the car)

[3]

**(b)** 1 mark for device and 1 mark for corresponding reason

**Device:**

- touch screen
- key pad (NOT keyboard)

**Reason:**

- easy to use interface
- limited number of options
- small space/space is limited
- other devices such as mouse, keyboard, trackball, ... not suitable

[2]

**(c)** Any **two** from:

- A solid state drive has no moving parts
- A solid state drive has faster random access
- A solid state drive has a quick start up/shut down time (reduced latency)
- A solid state drive is very small
- A solid state drive is very light
- A solid state drive consumes very little power
- A solid state drive does not generate a lot of heat (therefore safer in this application) [2]