CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary and Advanced Level

MARK SCHEME for the October/November 2015 series

9608 COMPUTER SCIENCE

9608/13 Paper 1 (Written Paper), maximum raw mark 75

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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CAMBRIDGE
International Examinations

1 (a) any **two** from:

– sequence of digital signals / bits
– over a communication path / Internet
– transfer of data at high speed
– requires fast broadband connection
– requires some form of buffering
– bits arrive in the same order as sent [2]

(b) (i) any **two** from:

– no need to wait for a whole file to be downloaded
– no need to store large files on user's computer
– allows on demand playback
– no specialist software is required for playback in browser [2]

(ii) any **two** from:

– video stops / hangs if very slow Internet / broadband speed low
– video stops / hangs if inadequate buffering capacity
– loss of Internet means can't access films / files
– may require specific software to run the files / films
– viruses can be downloaded from the websites [2]

(c) 2 marks for on-demand and 2 marks for real-time

on-demand

– digital video tape, analogue video tape, or digital files are converted to bit streaming – format for broadcasting on the net; this is known as encoding these encoded streaming video files are then uploaded to a dedicated server
– a link for the encoded video is placed on a web site
– a user clicks on the link to download the encoded streaming video; the streamed video is
– then broadcast to the user as and when they require it
– can be paused / can go back and re-watch / fast-forward, etc.

real-time

– an event is captured live with a video camera
– the video camera is connected to a computer
– the video signal is converted to streaming media files (encoded) on the computer
– the encoded feed is then uploaded from the computer to a dedicated streaming server via cable, DSL, or a high-speed internet connection
– the server then sends the live images it to all users requesting it as real-time video streaming
– cannot be paused etc. [4]

2 **(a)** A = control bus

B = address bus

C = data bus [3]

(b) Program Counter – stores the address of next instruction to be executed

Memory Data Register – stores the data in transit between memory and other registers // holds the instruction before it is passed to the CIR

Current Instruction Register – stores the current instruction being executed

Memory Address Register – stores the address of the memory location which is about to be accessed [4]

3 **(a)**

Statement	True (✓)
The IP address consists of any number of digits separated by single dots (.)	
Each number in an IP address can range from 0 to 255	✓
IP addresses are used to ensure that messages and data reach their correct destinations	✓
Public IP addresses are considered to be more secure than private IP addresses	

accept words TRUE or FALSE in right hand column
1 mark per tick, –1 mark for each wrong tick if more than 2 [2]

(b) **(i)** http – enables browser to know what protocol is being used to access information in the domain

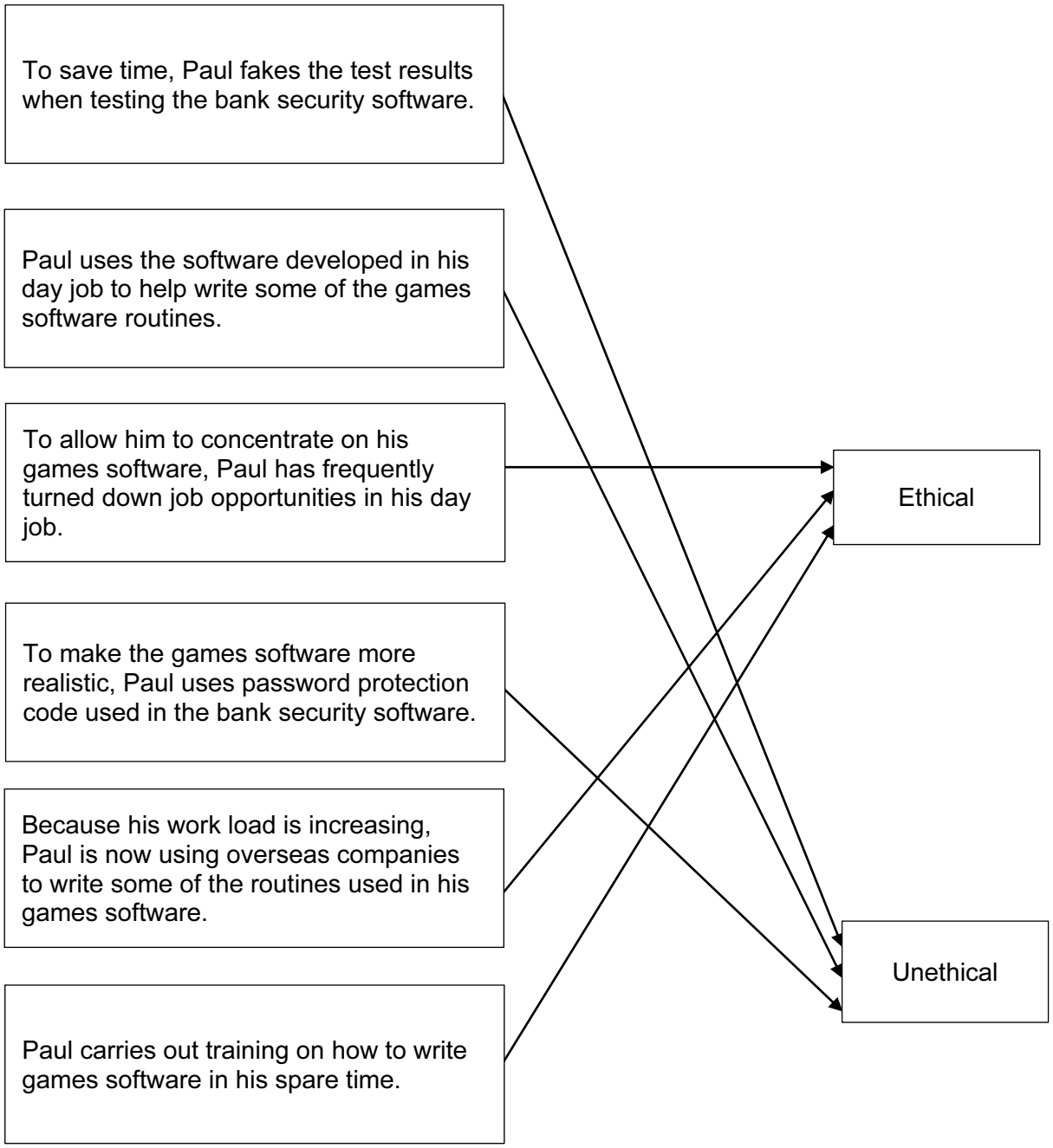
cie.org.uk – cie.org.uk is the domain name

computerscience.html – actual web page / file being viewed [3]

(ii) **%20** – because <space> not allowed in a URL, %20 is the coding for a space (32 in denary)

? – separates the URL from all parameters or variables [2]

4



1 mark for each correct line, two lines from one box is incorrect [6]

5 **(i)** any **four** from:

- sensors send signals / data to a computer
- data / signal converted to digital (using an ADC)
- computer calculates the activity value based on sensor signal strength / data
- if calculated value > 3,
- determine location of sensor
- build up a map of seismic activity
- location and magnitude sent to printer
- … via USB port / wireless link
- monitoring is continuous [4]

(ii) – output / hard copy not picked up in good time [1]

(iii) 1 mark for name + 1 mark for reason for choice

- speaker / buzzer / alarm bell
- gives control room operators an audible warning
- flashing lights
- gives control room operators an visual warning
- monitor
- use of red / flashing colours on monitor gets the attention of operators [2]

6 any **four** points from (maximum 3 marks per type of cable):

- fibre optic cables have greater bandwidth
- fibre optic cables need less signal boosting // can transmit over longer distances
- fibre optic cables have greater security (more difficult to “tap” into)
- fibre optic cables are immune to electromagnetic and other effects
- fibre optic cabling is lighter in weight (easier to install)
- fibre optic cables consume less power
- copper cabling is less expensive to install
- copper cable is easier to install <u>because</u> it is more flexible
- it is easier to make terminations using copper cabling
- the expertise in use of copper cabling is more extensive
- has been around for years … so very little is “unknown” about installations using this type of cabling [4]

7 (a) (i)
- at least one computer used to "serve" …
- … other computers are referred to as "clients"
- server provides services / applications etc. …
- … which may be requested by clients [2]

(ii) any **two** from:

- files and resources are centralised
- creation of security / manage security
- user needs user name and password to access network
- centralised back-up
- intranet capability
- Internet monitoring
- Clients can be less powerful machines, therefore less expensive to buy
- Saving resources on server reduces the burden on the client [2]

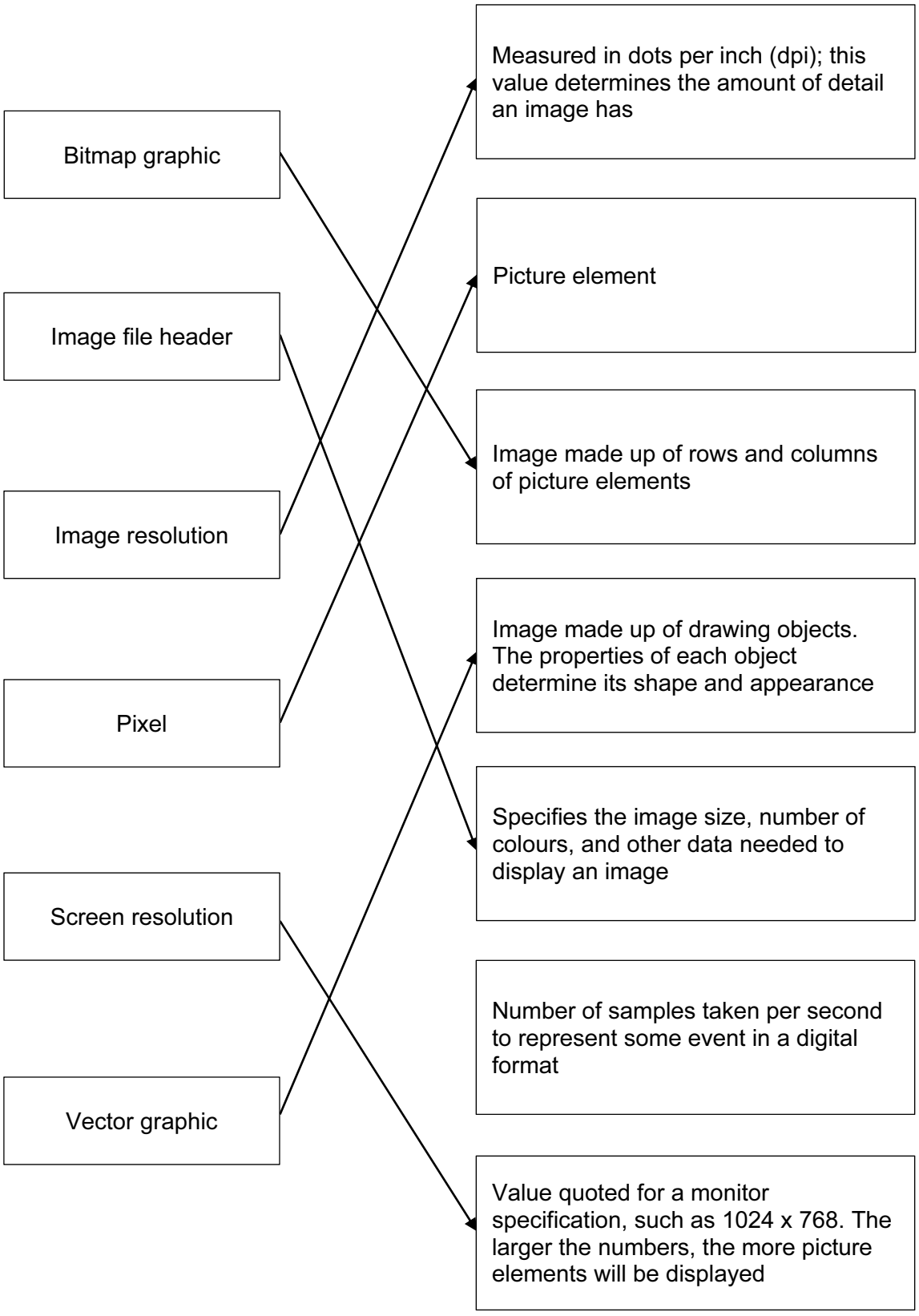
(b) router [1]

(c)

Statement	Sequence number
The requested web page is displayed on the client computer	**5**
The user clicks on the hyperlink and the web page is requested from the web server	**1**
The requested web page content is transmitted to the client computer	**3**
The client computer processes the JavaScript code using the web browser software	**4**
The web server locates the requested web page	**2**

[5]

8 (a)



1 mark for each correct line, two lines from one box is incorrect [6]

(b) (i) $\frac{512 \times 256}{8 \times 1024}$ = 16 KB

1 mark for numerator + 1 mark for denominator [2]

(ii) so it is possible to estimate how many images can be stored / to decide if it can be sent as an email attachment [1]

9 (a) One mark for validation, one mark for verification.

Validation

– check whether data is reasonable / meets given criteria

Verification

– method to ensure data which is copied / transferred is the same as the original
– entering data twice and computer checks both sets of data
– check entered data against original document / source [2]

(b) Any **four** from:

– parity can be even or odd
– parity check uses the number of 1s in a binary pattern
– if there is an even / odd number of 1s, then the parity is even / odd
– following transmission …
– parity of each byte checked
– a parity bit is used to make sure binary pattern has correct parity
– example: 1 0 0 1 0 1 1 1 has parity bit set to 1 in MSB since system uses odd parity (original data: 0 0 1 0 1 1 1 which has four 1 bits) [4]

10 (a) any **two** from:

– malicious code / software / program
– that replicates / copies itself
– can cause loss of data / corruption of data on the computer
– can cause computer to “crash” / run slowly
– can fill up hard disk with data [2]

(b) any **two** from:

– checks for boot sector viruses when machine is first turned on
– when an external storage device is connected
– checks a file / web page when it is accessed / downloaded [2]

11

Statement	Interpreter	Compiler
This translator creates an executable file		✓
When this translator encounters a syntax error, game execution will halt	✓	
The translator analyses and checks each line just before executing it	✓	
This translator will produce faster execution of the game program		✓
Use of this translator makes it more difficult for the user to modify the code of the game supplied to the user		✓

1 mark for each correct row [5]