

**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

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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]



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- 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)

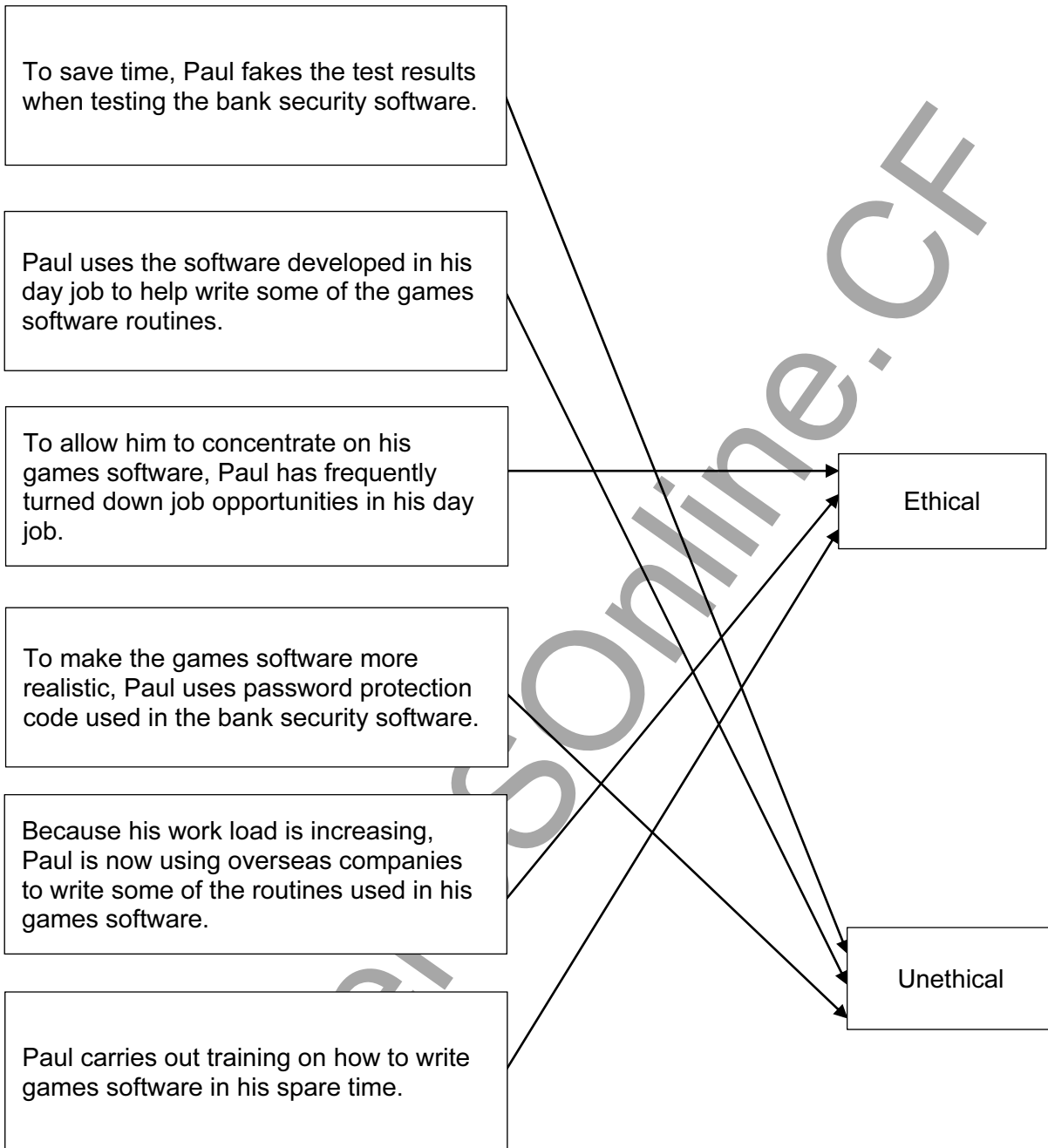
Statement	True (✓)
The IP address consists of any number of digits separated by single dots (.)	
Each number in an IP address can range from 0 to 255	✓
IP addresses are used to ensure that messages and data reach their correct destinations	✓
Public IP addresses are considered to be more secure than private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

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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 because 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]

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- 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]

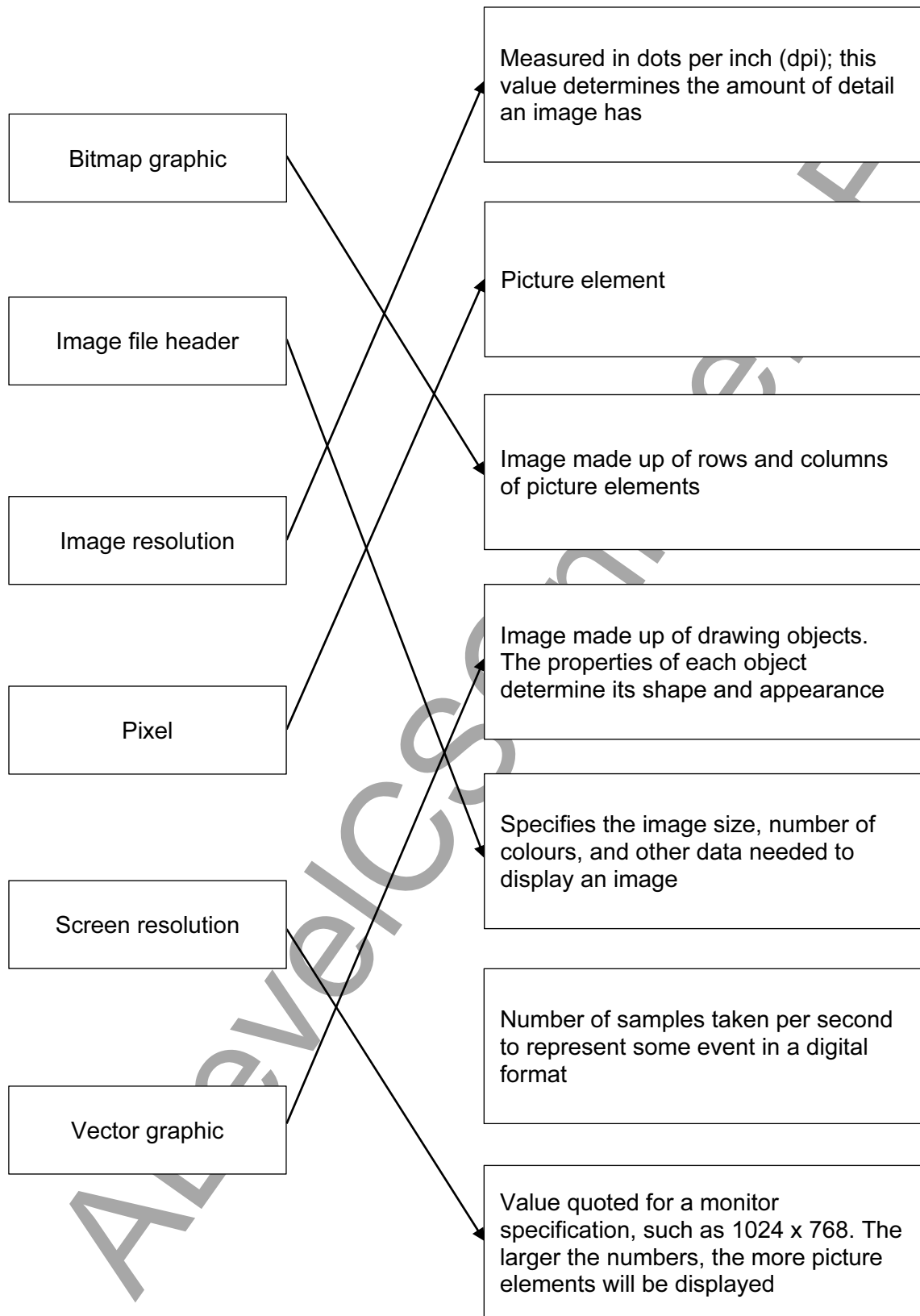
(b) router [1]

(c)

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

[5]

8 (a)



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

[6]

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

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

<b>Statement</b>	<b>Interpreter</b>	<b>Compiler</b>
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]

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