4 1 mark per correct word

1 protocol

2 web server name

3 file name

accept these three items in any order

HTML tags/text

firewall

proxy server

[6]

5 **1** mark per device, **1** mark per category

Description of storage device	Name of storage device	Category of storage		
		Primary	Secondary	Off-line
optical media which uses one spiral track; red lasers are used to read and write data on the media surface; makes use of dual-layering technology to increase the storage capacity	**DVD**			✓
non-volatile memory chip; contents of the chip cannot be altered; it is often used to store the start-up routines in a computer (e.g. the BIOS)	**ROM**	✓		
optical media which uses concentric tracks to store the data; this allows read and write operations to be carried out at the same time	**DVD-RAM**	✓		**(✓)**
non-volatile memory device that uses NAND flash memories (which consist of millions of transistors wired in series on single circuit boards)	**Solid State Drive/memory (SSD)**		✓	
	(SD/XD card) (USB storage device)			**(✓)**
optical media that uses blue laser technology to read and write data on the media surface; it uses a single 1.1 mm polycarbonate disc	**Blue-ray**			✓

[10]

6 (a) virus

any **two** from:

– program/software that replicates/copies itself
– can delete or alter files/data stored on a computer
– can make the computer "crash"/run slow

pharming

any **two** from:

– malicious code/software installed on a user's hard drive/actual web server
– this code redirects user to a fake website (without their knowledge)
– to obtain personal/financial information/data

phishing

any **two** from:

– legitimate-looking emails sent to a user
– as soon as recipient opens/clicks on link in the email/attachment …
– … the user is directed to a fake website (without their knowledge)
– To obtain personal/financial information/data

[6]

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

– spyware/key logging software can only pick up key presses

– using mouse/touchscreen means no key presses to log

– the numbers on the key pad are in random/non-standard format, which makes it more difficult to interpret [2]

8 (a) (i) Any **two** from:

– to protect against key logging software/spyware
– can stop key presses being recorded
– can stop key presses being relayed
– drop down boxes cannot be recorded as key presses
– drop down boxes can be placed in different location on the screen each time (to overcome screen capture issues) [2]

(ii) Any **one** from:

– hacker never finds all characters on the first hack
– makes it more difficult for hackers to find the order of the characters
– hacker needs to hack the system several times to gain the whole password
– shoulder surfing will not give person full password [1]

(b) Any **two** from:

– fingerprint scanner
– face recognition software
– retina scanner/iris scanner
– voice recognition software [2]

9 (a) **1** mark for correct check digit and **1** mark for showing the calculation

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

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

$105/11 = 9$ remainder 6

1 mark for any correct line of working

check digit is: **6** [2]

(b) **incorrect** check digit [1]

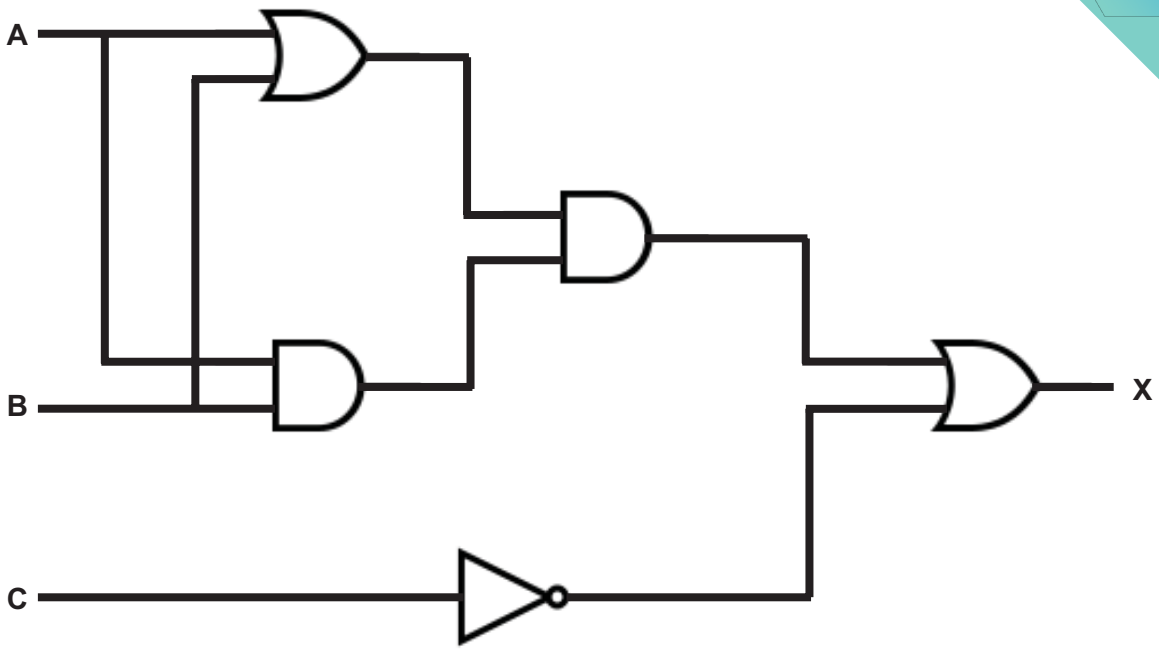
– check digit should be 1
– (3*1) + (2*2) + (4*3) + (0*4) + (0*5) + (4*6) + (5*7) // 3 + 4 + 12 + 0 + 0 + 24 + 35 // Total = 78
– 78/11 gives 7 remainder 1 [2]

7 (a)

A	B	C	Working space	X
0	*0*	*0*		**0**
0	*0*	*1*		**1**
0	*1*	*0*		**0**
0	*1*	*1*		**1**
1	*0*	*0*		**0**
1	*0*	*1*		**1**
1	*1*	*0*		**1**
1	*1*	*1*		**0**

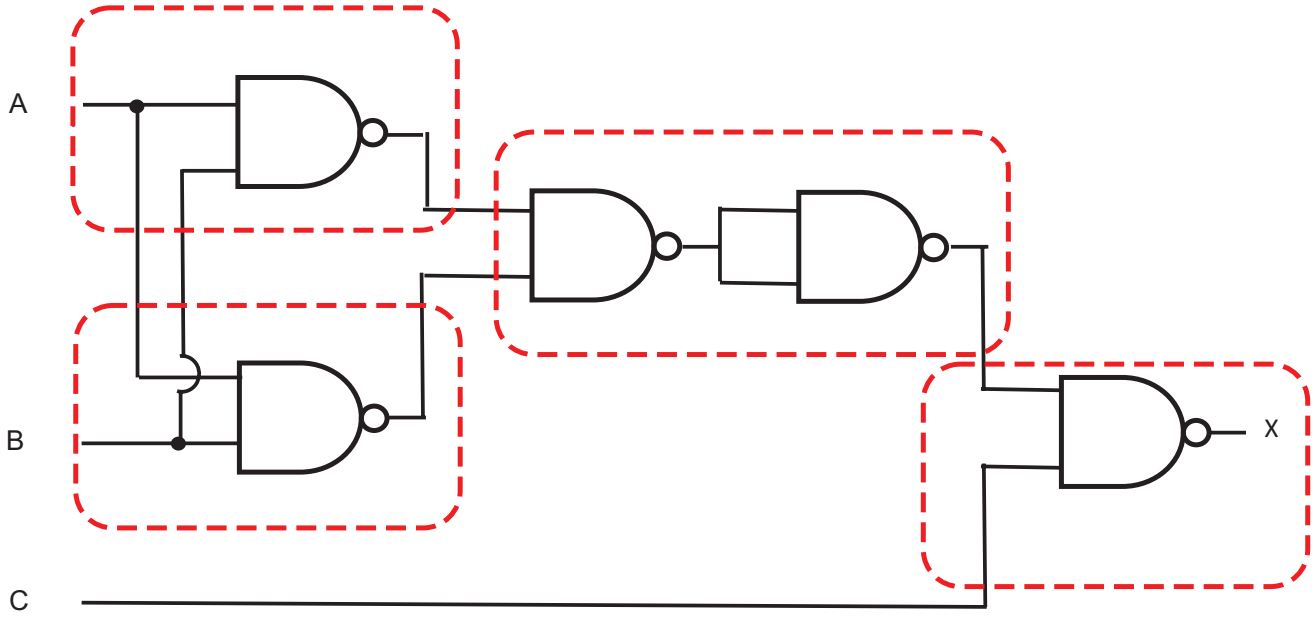
4 marks for 8 correct X bits
3 marks for 6 correct X bits
2 marks for 4 correct X bits
1 mark for 2 correct X bits [4]

(b) **1** mark for each correct gate with correct source of input



[5]

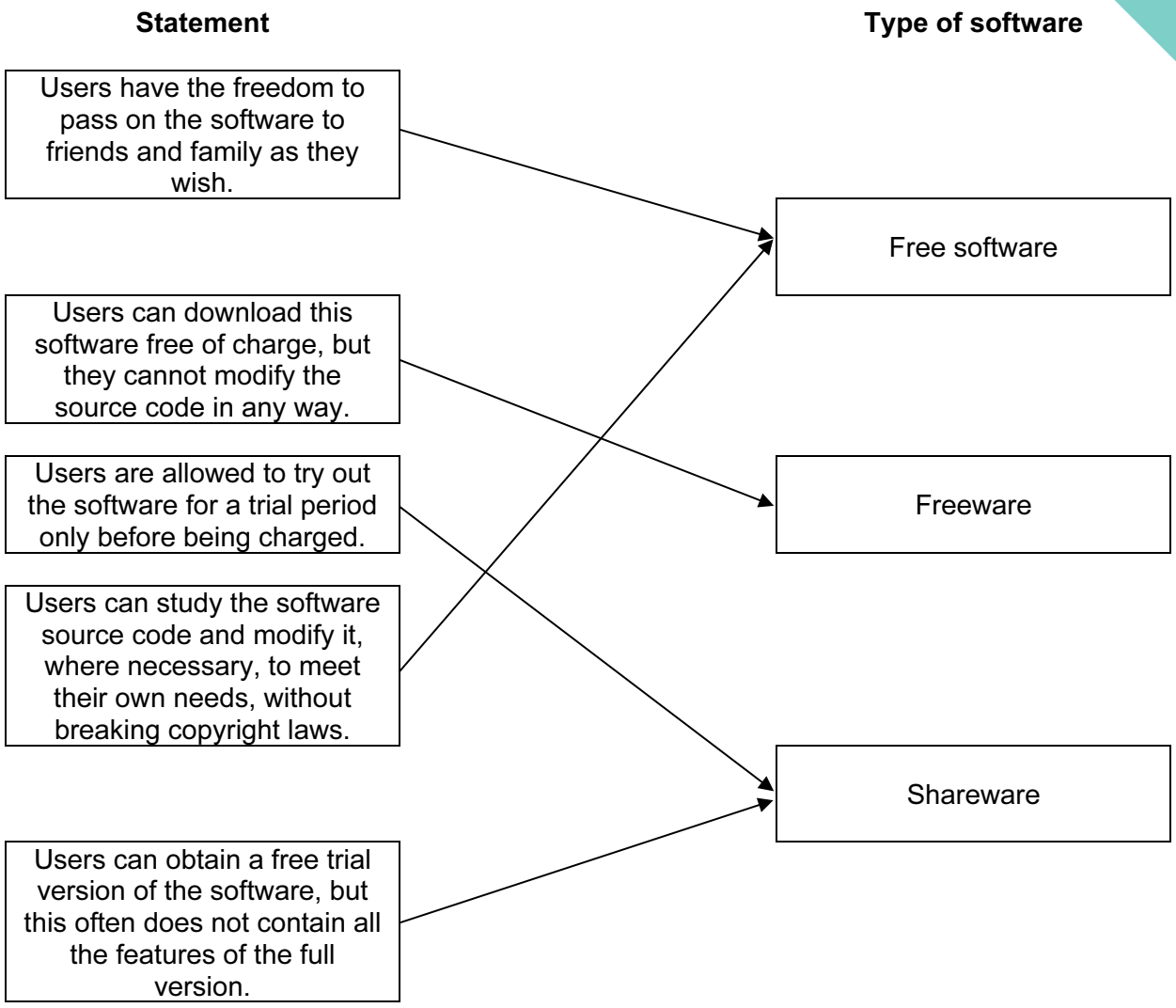
(c) Each dotted area is **1** mark



[4]

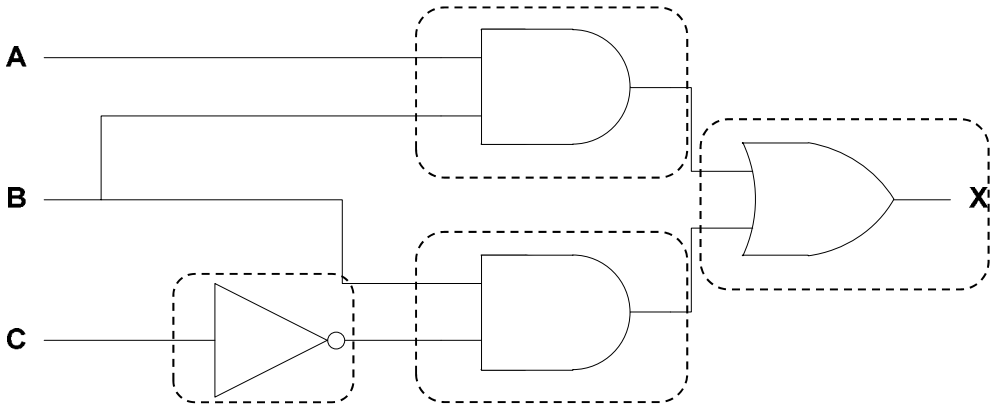
8 (a) **1** mark for correct lines from each type of software

NOTE: <u>all</u> statements that are correct must be connected to the correct type of software for the mark to be awarded



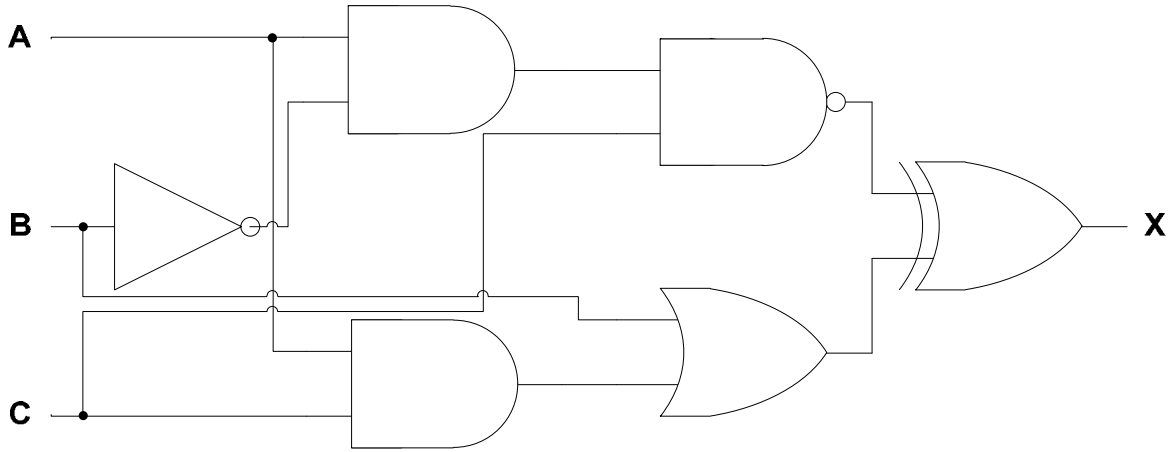
[3]

QUESTION 4.

<table>
<tr><th>Question</th><th>Answer</th><th></th></tr>
<tr><td>10(a)</td><td>1 mark for each correct gate, with the correct input(s)
 
</td><td></td></tr>
<tr><td>10(b)</td><td>
<table>
<tr><th>A</th><th>B</th><th>C</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td></tr>
</table>
4 marks for 8 correct outputs
3 marks for 6 or 7 correct outputs
2 marks for 4 or 5 correct outputs
1 mark for 2 or 3 correct outputs</td><td>4</td></tr>
</table>

Question	Answer	
11	**Seven** from: **Requested** • a web browser is used • user enters the URL / web address (into the address bar) // clicks a link containing the web address // clicks an element of the webpage • the URL / web address specifies the protocol • protocols used are Hyper Text Transfer Protocol (HTTP) / Hyper Text Transfer Protocol Secure (HTTPS) **Sent** • the URL / web address contains the domain name • the Internet Service Provider (ISP) looks up the IP address of the company • the domain name is used to look up the IP address of the company • the domain name server (DNS) stores an index of domain names and IP addresses • web browser sends a request to the web server / IP address **Received** • Data for the website is stored on the company's web server • webserver sends the data for the website back to the web browser • web server uses the customer's IP address to return the data • the data is transferred into Hyper Text Mark-up Language (HTML) • HTML is interpreted by the web browser (to display the website)	

QUESTION 5.

Question	Answer	Marks
7(a)	1 mark for each correct logic gate with correct direct of input(s):  	6
7(b)	4 marks for 8 correct outputs 3 marks for 6 or 7 correct outputs 2 marks for 4 or 5 correct outputs 1 mark for 2 or 3 correct outputs	4

A	B	C	Working space	X
0	0	0		1
0	0	1		1
0	1	0		0
0	1	1		0
1	0	0		1
1	0	1		1
1	1	0		0
1	1	1		0

Question	Answer	Marks
8	1 mark for correct translator, 3 marks for explanation: – Compiler Any **three** from: – Does not require recompilation // compiled program can be executed without a compiler … – ... therefore, allows faster execution – Provides an executable file … – … therefore, allows him to just send machine code – **Dimitri's friend** does not need translation/compilation **software** to execute the program	**4**

Question	Answer	Marks
9(a)	QR/Quick response	**1**
9(b)	Any **four** from: – Read/scanned using **app** (on mobile device) – It is the **camera** that is used to scan/capture the image – The three large squares are used to define the alignment // uses alignment targets/modules – Black squares reflect less light // white squares reflect more light – The app/device processes the image – Each small square/pixel is converted to a binary value	**4**

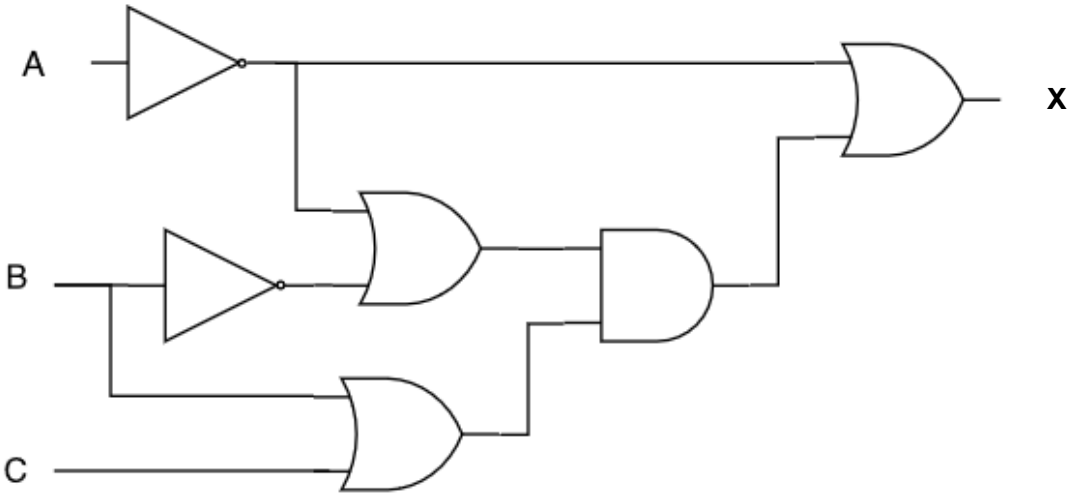
Question	Answer	Marks
10(a)	Any **four** from: – Conductive layer – An electrostatic/electric field is created – **Sensor(s)** (around the screen) monitor the electrostatic field – When touched (electrostatic) charge is transferred to finger – Location of touch is **calculated** // Co-ordinates used to **calculate** touch	**4**

QUESTION 6.

Question	Answer	Marks
8(a)		**4**

A	B	C	X
0	0	0	**1**
0	0	1	**1**
0	1	0	**0**
0	1	1	**1**
1	0	0	**0**
1	0	1	**1**
1	1	0	**1**
1	1	1	**1**

All 8 for 4 marks
6 or 7 for 3 marks
4 or 5 for 2 marks
2 or 3 for 1 mark

Question	Answer	Marks
8(b)	 1 mark per gate with correct inputs	**6**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>9</td><td>
<table>
<tr><th>Statement</th><th>Assembler (✓)</th><th>Compiler (✓)</th><th>Interpreter (✓)</th></tr>
<tr><td>Translates high-level language into machine code</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>Provides error diagnostics</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Translates whole program to object code in one operation</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Translates and executes one line of code at a time</td><td></td><td></td><td>✓</td></tr>
</table>
1 mark for each correct column
</td><td>3</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>10</td><td>Any six from:
– Program counter (PC) holds address / location of the instruction
– The address held in PC is sent to MAR
– Address is sent using address bus
– PC is incremented
– The instruction is sent from address in memory to MDR
– Instruction is transferred using the data bus
– Instruction sent to CIR</td><td>6</td></tr>
</table>

QUESTION 7.

Question	Answer	Marks
3(a)	Any **four** from: – Encryption key is used – Encryption algorithm is used – Encryption key / algorithm is applied to plain text – … to convert it into cypher text – Same key is used to encrypt and decrypt the text	**4**
3(b)	Any **three** from: – Firewall – Password – Proxy server – Physical methods (by example e.g. CCTV, Locks) – Access rights – Asymmetric encryption – Disconnect from network	**3**

Question	Answer	Marks
4(a)(i)	– NAND 	**2**
4(a)(ii)	– NOR 	**2**

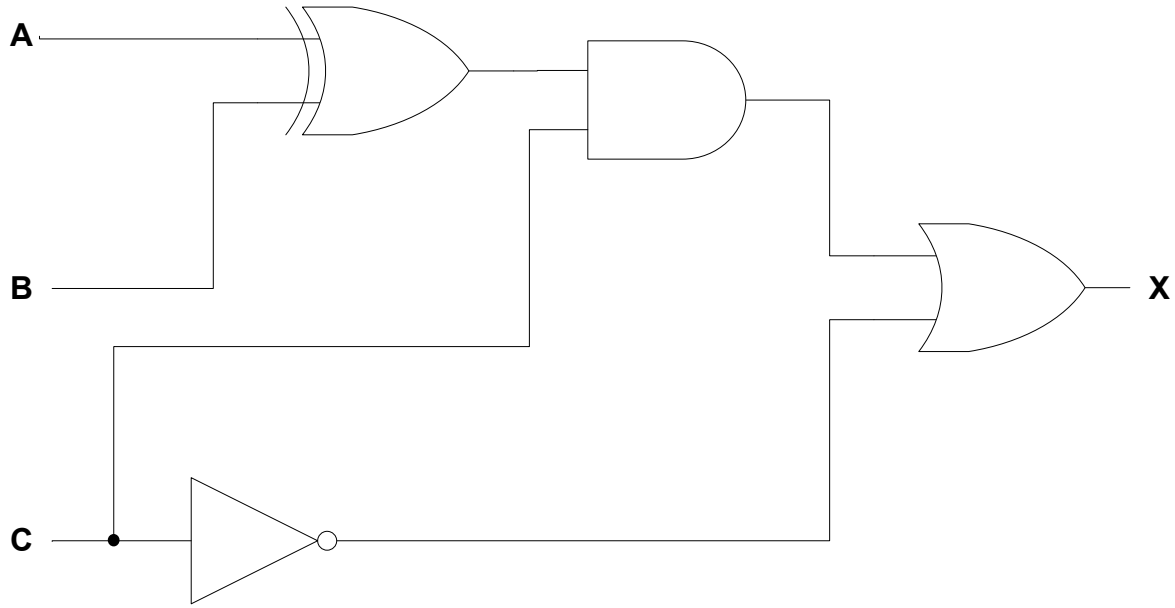
Question	Answer	Marks
4(b)		**4**

A	B	C	Working space	X
0	0	0		**0**
0	0	1		**0**
0	1	0		**1**
0	1	1		**1**
1	0	0		**0**
1	0	1		**0**
1	1	0		**1**
1	1	1		**1**

4 marks for 8 correct outputs
3 marks for 6 or 7 correct outputs
2 marks for 4 or 5 correct outputs
1 mark for 2 or 3 correct outputs

Question	Answer	Marks
5(a)	Any **three** from: – Convert HTML code – Display web pages – Check if a website is secure – Request web pages from a web server – Send URL/domain name – Runs active script – Store history/favourites/bookmarks – Create tabs	**3**

QUESTION 8.

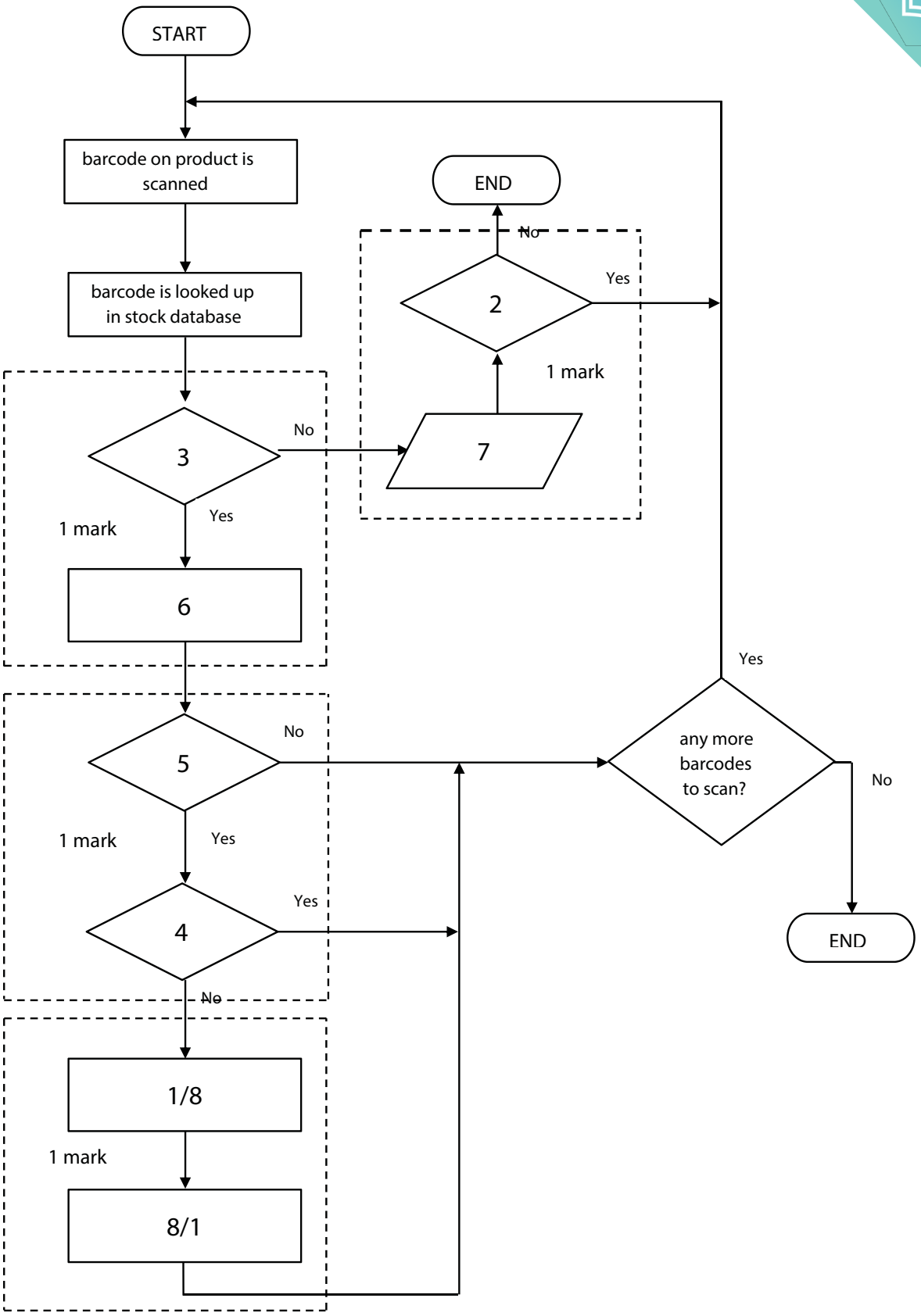
Question	Answer	Marks
6(a)	 One mark for each correct gate.	4

Question	Answer	Marks
6(b)		**4**

A	B	C	Working space	X
0	0	0		**1**
0	0	1		**0**
0	1	0		**1**
0	1	1		**1**
1	0	0		**1**
1	0	1		**1**
1	1	0		**1**
1	1	1		**0**

Question	Answer	Marks
7(a)	Any **four** from: – Examines outgoing traffic to check what is being requested – Examines incoming traffic to check the content of what is being received – Sets rules/criteria for websites that can/cannot be accessed // creates a blacklist – Check if traffic meets/does not meet rules/criteria – If it does/does not, access to website granted/denied	**4**
7(b)	Any **three** from: – Software that can replicate itself – It could cause the computer to crash / run slow / generate errors – It could delete/damage files – It could fill up the storage space – It could stop the hardware being able to communicate – It could spread to other devices on the network	**3**

3


START
barcode on product is scanned
barcode is looked up in stock database
3
No
Yes
1 mark
6
7
END
No
2
Yes
1 mark
5
No
Yes
1 mark
4
Yes
No
1/8
1 mark
8/1
any more barcodes to scan?
Yes
No
END

[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]

5 **(a)** Any **five** from:
- naming a suitable sensor, e.g infra-red, pressure, motion sensors, send signa
  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

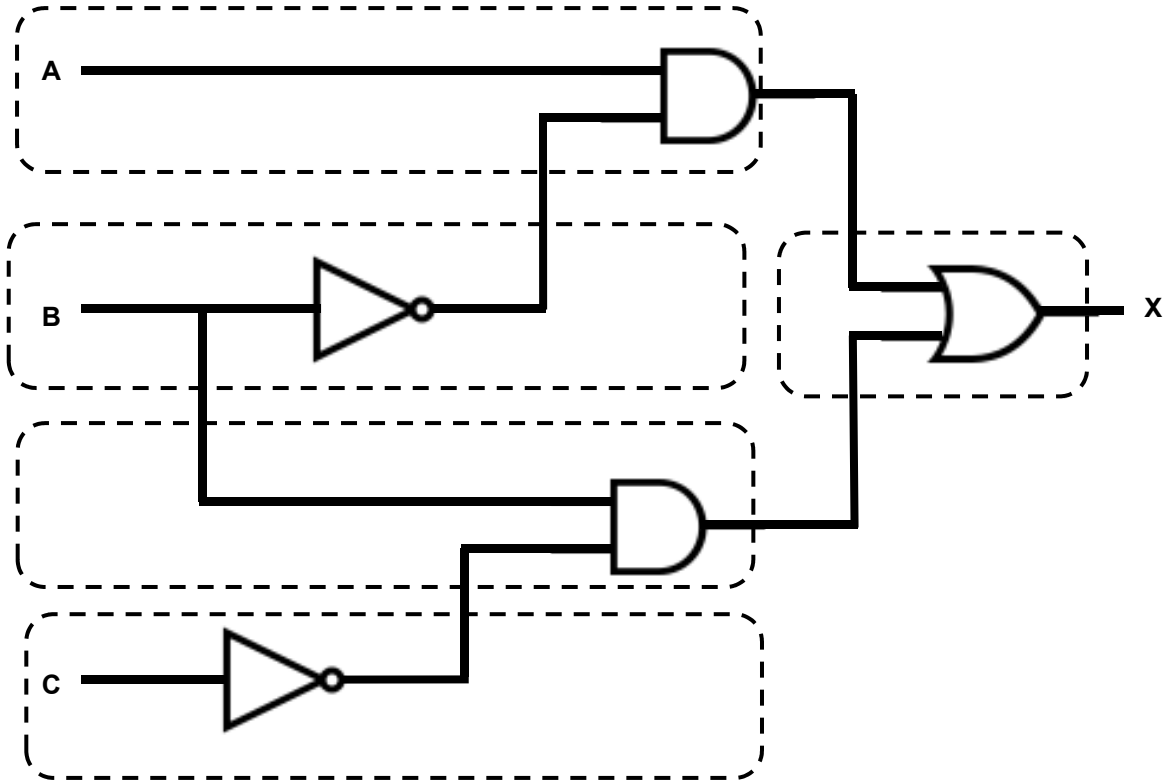
or
- microprocessor compares the biometric data from an image/video with stored biometric data for images/video …
- … if biometric data matched = stored data …
- … alert given to signal a person has been identified

- Continual/repeated process [5]

(b) 1 mark for correct calculation, 1 mark for correct answer
- number of photos = **12 × 60 × 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]

5 **(a)** 1 mark per correct section.



[5]

(b) 4 marks for 8 correct values
3 marks for 6 correct values
2 marks for 4 correct values
1 mark for 2 correct values

A	B	C	Working space	X
0	0	0		0
0	0	1		0
0	1	0		1
0	1	1		0
1	0	0		1
1	0	1		1
1	1	0		1
1	1	1		0

[4]

(c) Register Z

(d) **(i)** (byte) 5

(ii) (column) 4 [1]

(iii) corrected byte is: **1 0 0 1 1 1 1 1** [1]

(iv) that gives the value: **1 5 9**
(follow through applies) [1]

(v) Any **two** from:

– The byte would be transmitted without having 5 consecutive 1's
– The fault condition would not be recognised [2]

6 Any **two** from:

High level language

– easier/faster to write code as uses English-like statements
– easier to modify as uses English-like statements
– easier to debug as uses English-like statements
– portable language code

Any **two** from:

Low level language

– can work directly on memory locations
– can be executed faster
– translated program requires less memory [4]

7 Any **four** from:

– reaches maximum brightness quickly
– colours are vivid
– good colour definition/contrast can be achieved
– screens can be thinner/thin
– more reliable as LED's are long lasting
– consume very little/less energy [4]

7 (a) (i) 2 marks for 4 correct outputs,
1 mark for 2 correct outputs

1 mark for correct gate

A	B	Working space	X
0	*0*		0
0	*1*		0
1	*0*		0
1	*1*		1

AND gate

[3]

(ii) 2 marks for 4 correct outputs
1 mark for 2 correct outputs

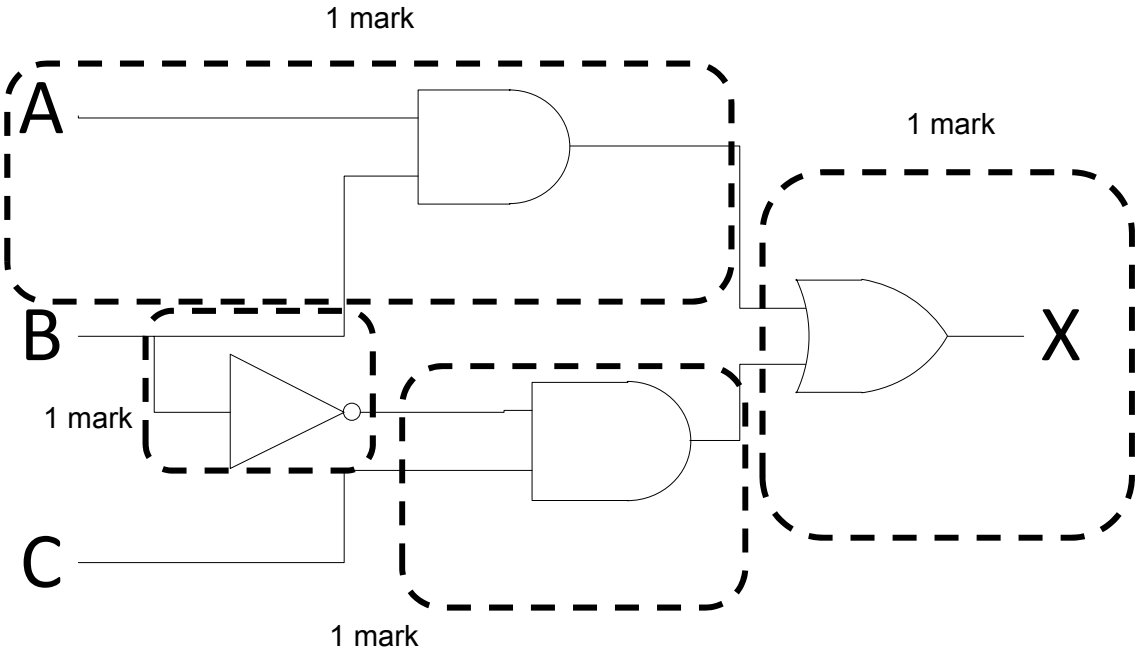
1 mark for correct gate

A	B	Working space	X
0	*0*		0
0	*1*		1
1	*0*		1
1	*1*		1

OR gate

[3]

(b)(i) 1 mark per correct section.



[4]

(ii) 4 marks for 8 correct outputs
3 marks for 6 correct outputs
2 marks for 4 correct outputs
1 mark for 2 correct outputs

A	B	C	Working space	X
0	*0*	*0*		0
0	*0*	*1*		1
0	*1*	*0*		0
0	*1*	*1*		0
1	*0*	*0*		0
1	*0*	*1*		1
1	*1*	*0*		1
1	*1*	*1*		1

[4]

8

Statement	TRUE or FALSE
MIDI stores the actual music notes in a compressed format	**FALSE**
JPEG files are examples of lossless file compression	**FALSE**
MP3 files are, on average, 90% smaller than the music files stored on a CD	**TRUE**
MP4 files are examples of lossy file compression	**TRUE**

[4]

9 **(a)** Any **two** from:

– a large number of requests are sent to the network/server all at once
– designed to flood a network/server with useless traffic/requests
– the network/server will come to a halt/stop trying to deal with all the traffic/requests
– prevents users from gaining access to a website/server

[2]

(b) 1 mark for each security threat and 1 mark for matching description

Security threat	Description
Viruses	– software that replicates – causes loss/corruption of data // computer may "crash"/run slow
Hacking/cracking	– illegal/ unauthorised access to a system/data
Phishing	– a link/attachment sends user to fake website (where personal data may be obtained)
Pharming	– malicious code installed on user's hard drive / computer – user is redirected to a fake website (where personal data may be obtained)
Spyware/key logger	– send/relay key strokes to a third party

[4]

QUESTION 12.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>3(a)</td><td>

4 marks for 8 correct outputs
3 marks for 6 or 7 correct outputs
2 marks for 4 or 5 correct outputs
1 mark for 2 or 3 correct outputs

<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>3(b)</td><td>Three from:

output of AND is 1 if both inputs are 1
output of AND is 0 if either or both inputs are 0
output of OR is 1 if either input is 1
output of OR is 0 if both inputs are 0
correct example of AND truth table
correct example of OR truth table

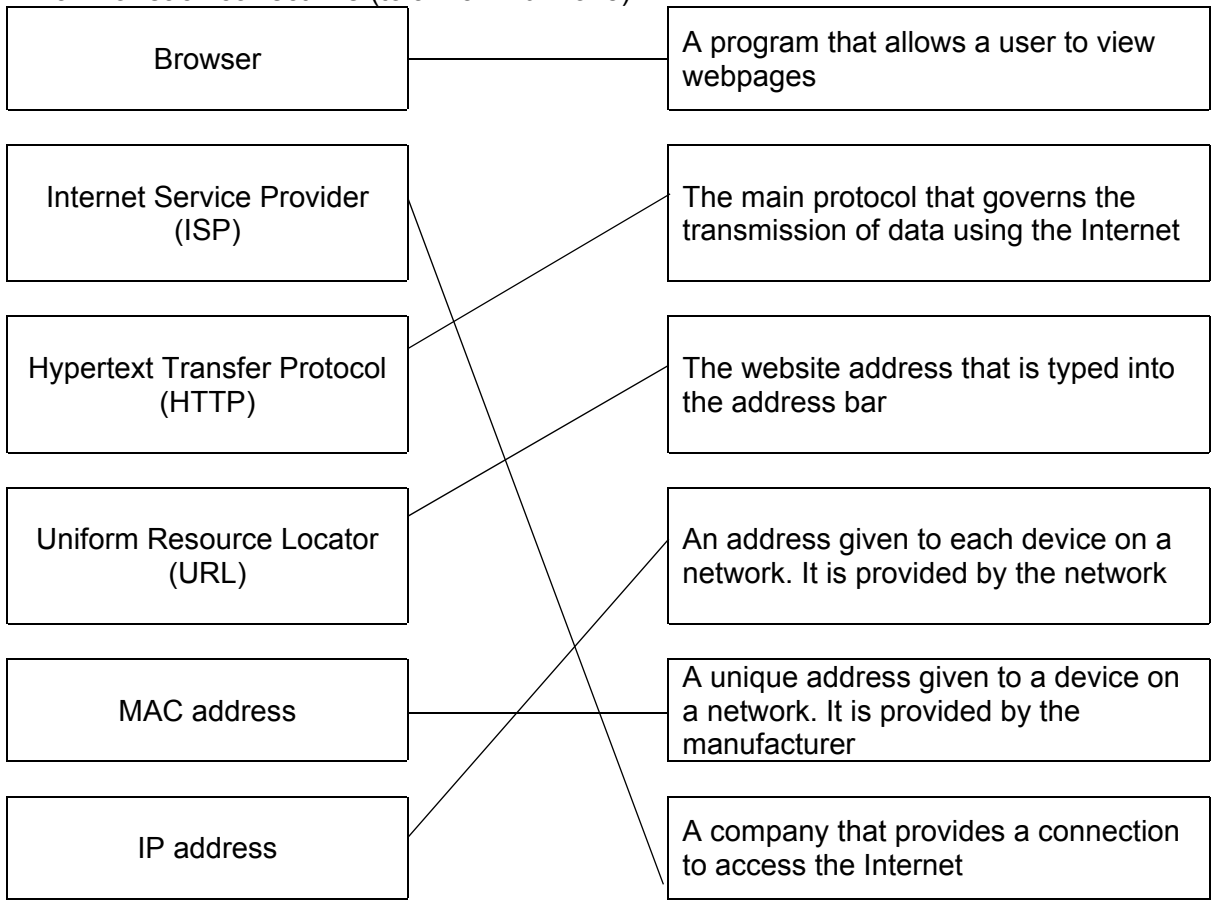
</td><td>3</td></tr>
</table>

Question	Answer	Marks
4(a)	**Four** from: Phishing: • A legitimate looking email is sent to a user • The email will encourage the user to click a link/open an attachment • The link will redirect a user to a legitimate looking webpage (to steal personal data) Pharming: • A malicious code is installed on a user's hard drive/server • The code will cause a redirection to a legitimate looking webpage (to steal personal data)	**4**
4(b)	**Two** from: • Hacking • Cracking • Virus • Denial of service • Malware • Spyware	**2**
4(c)	**Two** from: • Firewall • Proxy server • Anti-virus • Anti-malware • Anti-spyware • Username and password	**2**

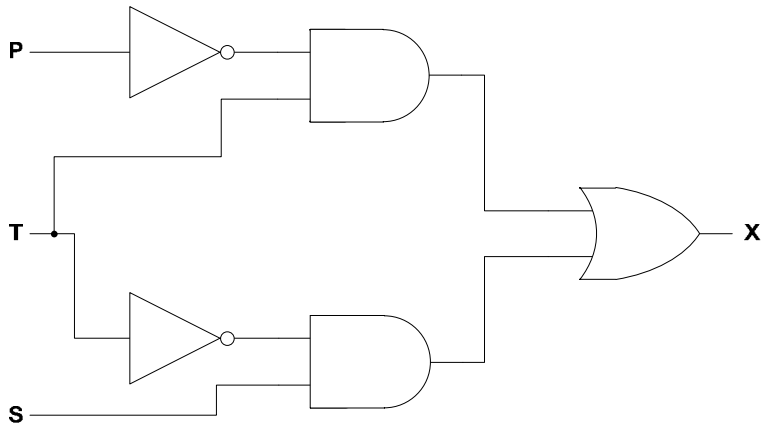
QUESTION 13.

Question	Answer	Marks
6(a)	• Compiler • Interpreter	**2**
6(b)	**Four** from: • Closer to human language/English … • … so it is easier/quicker to read/write/understand • … so it is easier/quicker to debug the program • … therefore, less likely to make errors • The program can be used on many different platforms … • … because it is written in source code • … because it is compiled into object code • They have built-in functions/libraries … • … this saves time when writing the program • Do not need to manipulate memory addresses directly … • … therefore, specialist knowledge of this is not required • Only need to learn a single language … • … as this can be used on many different computers	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(c)</td><td>1 mark for each correct tick (✓)
<table>
<tr><th>Computer code</th><th>High-level language (✓)</th><th>Assembly language (✓)</th><th>Machine code (✓)</th></tr>
<tr><td>10110111
11001100
01011100</td><td></td><td></td><td>✓</td></tr>
<tr><td>FOR X = 1 TO 10
  PRINT X
NEXT X</td><td>✓</td><td></td><td></td></tr>
<tr><td>INP X
STA X
LDA Y</td><td></td><td>✓</td><td></td></tr>
</table></td><td>3</td></tr>
</table>

Question	Answer	Marks
7	1 mark for each correct line (to a maximum of 5)  	**5**

QUESTION 14.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7(a)</td><td>
<table>
<tr><th>Input A</th><th>Input B</th><th>Output</th></tr>
<tr><td>0</td><td>0</td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td></tr>
</table>
</td><td>1</td></tr>
<tr><td>7(b)</td><td>• Exclusive OR / XOR / EOR</td><td>1</td></tr>
<tr><td>7(c)</td><td>One mark for each correct logic gate with correct inputs
 
</td><td>5</td></tr>
<tr><td>7(d)</td><td>Two from:
• Can work continuously
• Avoids human error
• It could be a dangerous environment and will avoid human risk
• Detect errors instantly
• Maintain consistent and correct conditions</td><td>2</td></tr>
</table>

Question	Answer	Marks
8	**Six** from: • PC holds address of the instruction • The address held in PC is sent to MAR … • … using address bus • MAR goes to location in memory where instruction is stored • Instruction sent to MDR … • … using data bus • Instruction sent to CIR • Control unit sends signals to manage the process … • … using the control bus	**6**
9(a)	**Two** from: • Layout of the webpage • e.g. where a paragraph is placed • Defined using tags	**2**
9(b)	**One** mark for each correct term in the correct order: • browser • IP address • web server • HTML	**4**

QUESTION 15.

Question	Answer	Marks
7(c)	**Three** from: • Hypertext Transfer Protocol Secure // It is a protocol … • … that is a set of rules/standards • Secure version of HTTP • Secure website // secures data • Uses TLS / SSL • Uses encryption	**3**

Question	Answer	Marks
8(a)	• X = 1 if (A is 1 XOR C is 1) OR (B is 1 NAND C is NOT 1) • X = (A XOR C) OR (B NAND NOTC) **One** mark for each bullet: • (A XOR C) • OR • (B NAND NOTC)	**3**

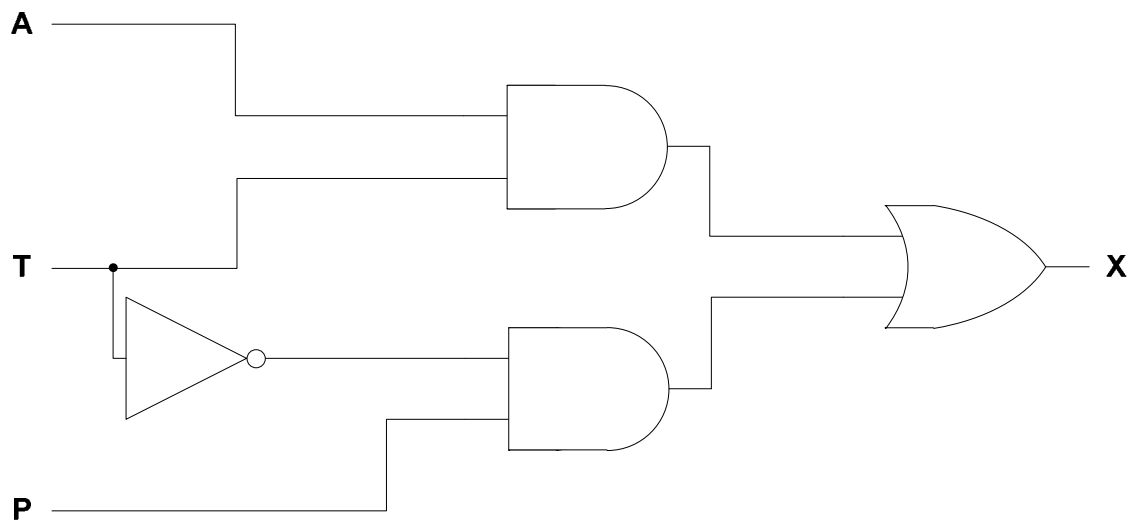
<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>8(b)</td><td>
Four marks for 8 correct outputs
Three marks for 6 or 7 correct outputs
Two marks for 4 or 5 correct outputs
One mark for 2 or 3 correct outputs

<table>
<tr><th>A</th><th>B</th><th>C</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr>
</table>
</td><td>4</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>9(a)</td><td>One mark per each correct tick

<table>
<tr><th>Statement</th><th>True (✓)</th><th>False (✓)</th></tr>
<tr><td>Duplex data transmission can be either serial or parallel</td><td>✓</td><td></td></tr>
<tr><td>Duplex data transmission is when data is transmitted both ways, but only one way at a time</td><td></td><td>✓</td></tr>
<tr><td>Duplex data transmission is always used to connect a device to a computer</td><td></td><td>✓</td></tr>
<tr><td>Duplex data transmission is when data is transmitted both ways at the same time</td><td>✓</td><td></td></tr>
<tr><td>Duplex data transmission automatically detects any errors in data</td><td></td><td>✓</td></tr>
</table></td><td>5</td></tr>
<tr><td>9(b)</td><td>• Parallel data transmission</td><td>1</td></tr>
</table>

QUESTION 16.

Question	Answer	Marks
4(a)	**One** mark for each correct logic gate with correct input(s) 	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>4(b)</td><td>
Four mark for 8 correct outputs
Three marks for 6 or 7 correct outputs
Two mark for 4 or 5 correct outputs
One mark for 2 or 3 correct outputs

<table>
<tr><th>A</th><th>T</th><th>P</th><th>Working space</th><th>X</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td></td><td>0</td></tr>
<tr><td>0</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>0</td><td>1</td><td>0</td><td></td><td>0</td></tr>
<tr><td>0</td><td>1</td><td>1</td><td></td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td></td><td>0</td></tr>
<tr><td>1</td><td>0</td><td>1</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td></td><td>1</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td></td><td>1</td></tr>
</table>
</td><td>4</td></tr>
<tr><td>4(c)</td><td>
Six from:
• Sensor sends a signal/reading/data to the microprocessor
• Signal/reading/data is analogue and is converted to digital using ADC
• Reading/data is stored in the system
• Microprocessor compares data/reading to the pre-set value of 7
• If value is greater than 7 …
• … a signal/data is sent by the microprocessor to display a warning message on a monitor
• The process is continuous
</td><td>6</td></tr>
</table>

Question	Answer	Marks
5	**One** mark for each correct parity bit	**3**

	Parity bit							
Register A	**0**	0	1	0	0	0	1	1
Register B	**0**	0	0	0	0	1	1	1
Register C	**0**	0	0	0	0	0	1	1

Question	Answer	Marks
6(a)	• Free software	**1**
6(b)	• Freeware	**1**
6(c)	• Shareware	**1**
6(d)	• Plagiarism // Intellectual property theft	**1**
6(e)	• Copyright	**1**