cea

Rewarding Learning

General Certificate of Secondary Education
2018

Digital Technology

Unit 1: (Compulsory Core)

Digital Technology

[GDG11]   *GDG11*

THURSDAY 17 MAY, AFTERNOON

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
You must answer the questions in the spaces provided.
Do not write outside the boxed area on each page or on blank pages.
Complete in black ink only. **Do not write with a gel pen.**
Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 90.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
Quality of written communication will be assessed in Questions **3(b)** and **6(b)**.

For Question 1 insert the appropriate letter in the space provided.

1 **(a)** Select the statement which is true about data.

    A Data is facts and figures which has been processed and given a meaning.

    B Data is facts and figures which has not been processed but has meaning.

    C Data is facts and figures which has not been processed and has no meaning.

    D Data is facts and figures which has been processed but has no meaning.

Answer _____ [1]

(b) Select the statement in which the units of data storage are listed in ascending order (smallest to largest).

    A bit, byte, nibble, kilobyte

    B kilobyte, megabyte, terabyte, gigabyte

    C nibble, byte, kilobyte, megabyte

    D nibble, bit, byte, kilobyte

Answer _____ [1]

(c) Select the statement which is true about a buffer when transferring moving images.

    A A buffer is a continuous stream of data.

    B A buffer is a memory location used to store a downloaded part of a video before it is watched.

    C A buffer is a large video downloading from the Internet whilst it is being watched.

    D A buffer slows down video streaming and improves the user's experience.

Answer _____ [1]

(d) RSI stands for:

    A   Repetitive State Injury

    B   Repetitive Strain Injury

    C   Remote Strain Injury

    D   Remote State Injury

Answer _____ [1]

(e) Select the statement which describes the data encryption process.

    A   Encryption allows data to be transferred securely and data can only be read with a key.

    B   Encryption allows data to be transferred securely and data can be accessed without a key.

    C   Encryption prevents data from being transferred securely and data can be accessed without a key.

    D   Encryption prevents data from being transferred securely and data can only be read with a key.

Answer _____ [1]

(f) Max placed an item in his online shopping basket. Even though he did not press the purchase button, the company charged his bank account. Which law did the company break?

    A   Consumer Control Regulations

    B   Consumer Contracts Requirements

    C   Consumer Contracts Regulations

    D   Consumer Control Requirements

Answer _____ [1]

[Turn over

(g) Select the statement which correctly describes the role of the Information Commissioner.

    A   The person within an organisation who ensures the Data Protection Act is followed.

    B   The person who makes the public aware of their rights under the Data Protection Act.

    C   The person who collects data to be held by an organisation.

    D   The person who contacts the public to inform them that data is being stored about them.

Answer _____ [1]

(h) What do the letters HTTPS stand for?

    A   HyperText Transmission Protocol Safety

    B   HyperText Transfer Protocol Secure

    C   HyperText Transmission Protocol Secure

    D   HyperText Transfer Protocol Safety

Answer _____ [1]

BLANK PAGE

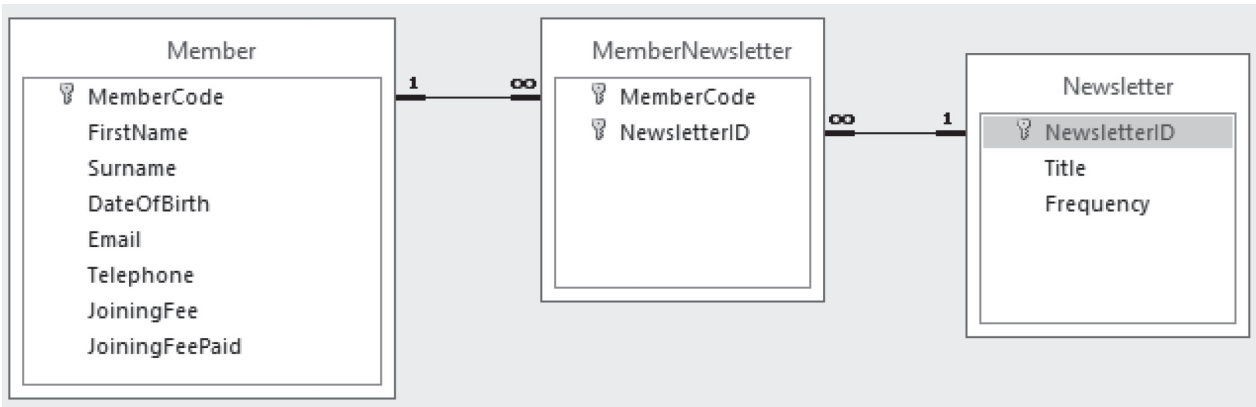**DO NOT WRITE ON THIS PAGE**

(Questions continue overleaf)

28GDG1105

2 World of Games is a company which distributes electronic newsletters to members via email. Below is a section of the database structure which holds members' details. All members over 16 are charged a joining fee of £20.00. The database records whether or not this fee has been paid in a field called JoiningFeePaid.

(a) Suggest the most suitable data types for the following fields:

Field	Data Type
DateOfBirth	[1]
JoiningFee	[1]

(b) In the Member table, MemberCode is shown as the primary key. What is the purpose of a primary key in a table?

_____

_____ [1]

(c) What type of relationship exists between the Member table and the MemberNewsletter table?

_____ [1]

(d) What is the purpose of the MemberNewsletter table?

_____

_____ [1]

3 The Internet of Things generates data, sometimes called 'big data', which can be analysed and interpreted.

(a) What is data analytics?

_____

_____ [2]

(b) Describe 'big data' by making reference to volume, velocity and variety.

_____

_____

_____

_____

_____

_____

_____

_____

_____ [6]

BLANK PAGE

DO NOT WRITE ON THIS PAGE

(Questions continue overleaf)

4 CPC is a small multimedia design business that supplies digital products. These include soundtracks, images and printed material.

(a) A client requests a high resolution bitmap image.

(i) Describe how a pixel is used in a bitmap image.

_____

_____ [2]

(ii) Explain the term resolution and its impact on an image.

_____

_____

_____ [2]

(b) The image has been saved in a number of file formats.

(i) Answer the questions in the table below.

File Format	
logo PNG image 52.1 KB	What do the letters PNG stand for? [1]
logo JPEG image 14.4 KB	What do the letters JPEG stand for? [1]

(ii) The image has also been saved as a bitmap image as shown below.

logo
BMP File
442 KB

Explain why the file size of the JPEG file is smaller than that of the BMP file.

_____

_____ [2]

(iii) The client has requested a vector-based graphic of the logo. Identify **one** way in which a vector-based graphic differs from a bitmap graphic.

_____

_____ [1]

[Turn over

5 John has purchased a laptop computer.

(a) The table below shows some of the technical specification for the laptop.

Operating system	Windows 10 (64-bit)
Processor	- Intel® Core™ i5-7200U Processor - Dual-core - 2.5 GHz / 3.1 GHz (Turbo Boost) - 3 MB cache
RAM	8 GB DDR4 - 2133 SDRAM
Storage	128 GB SSD

(i) Complete the following table, about the processor components, by inserting the appropriate values from the table above.

Processor component	Value
Clock speed	[1]
Cache size	[1]
Number of cores	[1]

(ii) How does the clock speed impact on the performance of the central processing unit?

_____

_____ [1]

28GDG1112

(iii) Describe the characteristics of the storage device provided with John's laptop.

_____

_____ [2]

(b) The system software on the laptop manages resources.

(i) Apart from allocating memory, list **two** other resources that are managed by system software.

1. _____

2. _____ [2]

(ii) Explain how memory is allocated by system software when a user wants to access data held on a hard disk.

_____

_____

_____ [3]

(c) Computer systems use different modes of processing. Complete the following paragraph, using the phrases listed below, to explain the modes of processing.

| airline booking systems | batch processing | real-time processing | billing systems |

Collecting groups of similar data over time and processing the data together is

called _____ . This type of processing is suitable

for _____ . Processing data immediately as it is collected

is called _____ . This type of processing is

suitable for _____ . [4]

[Turn over

6 A school connects computers on a star network.

(a) How do levels of access help protect data on a network?

_____

_____

_____ [2]

(b) Describe how computers are organised on a star network and explain the role of the file server on the network.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ [4]

BLANK PAGE

DO NOT WRITE ON THIS PAGE

(Questions continue overleaf)

7 Jen is using the following spreadsheet to calculate staff pay in her office.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Hours worked									
2	Name	Job Title	Rate of Pay	Mon	Tue	Wed	Thur	Fri	Total Hours	Weekly Pay		Job Title	Rate of Pay
3	A Smyth	Office Junior	£7.50	7.5	6	8	8	8	37.5	£281.25		Office Junior	£7.50
4	J McKee	Office Junior	£7.50	4	7	8.5	7	6	32.5	£243.75		Office Manager	£12.50
5	K Brown	Office Junior	£7.50	8	8	8	8	0	32	£240.00		Team Leader	£10.00
6	S Sloan	Office Junior	£7.50	8	6	8	7.5	8	37.5	£281.25			
7	P McFall	Team Leader	£10.00	8	8	8	8	8	40	£400.00			
8	I Murray	Office Junior	£7.50	4	4	4	4	4	20	£150.00			
9	B Jones	Office Junior	£7.50	5	5.5	7	0	0	17.5	£131.25			
10	E Jonston	Office Manager	£12.50	9	9	9	9	9	45	£562.50			
11		Average	£8.44	6.7	6.7	7.6	6.4	5.4	32.8				
12													
13									Total Staff Pay	£2,290.00			

(a) Apart from bold and centring the text, how have cells D1 to H1 been formatted?

_____ [1]

(b) Name the function used to carry out the calculation in cell J13.

_____ [1]

(c) A VLOOKUP function is used in column C to select the correct Rate of Pay from cells L2 to M5.

(i) Place a tick (✓) beside the correct VLOOKUP function used in cell C3.

VLOOKUP	Tick [✓]
=VLOOKUP(B3,$L$3:$M$5,1)	
=VLOOKUP(B3,$L$3:$M$5,2)	
=VLOOKUP(C3,L3:M5,1)	
=VLOOKUP(C3,L3:M5,2)	

[1]

(ii) Explain **one** advantage of using a VLOOKUP table in this way.

_____

_____ [1]

(iii) Some of the formulae listed in the table above use absolute cell references. Describe **one** advantage of using absolute cell references in spreadsheet formulae.

_____

_____ [2]

[Turn over

(d) Staff who work more than 40 hours are now automatically highlighted in a different colour as shown in column I in the spreadsheet below.

	A	B	C	D	E	F	G	H	I	J
1				Hours worked						
2	Name	Job Title	Rate of Pay	Mon	Tue	Wed	Thur	Fri	Total Hours	Weekly Pay
3	A Smyth	Office Junior	£7.50	7.5	6	8	8	8	37.5	£281.25
4	J McKee	Office Junior	£7.50	4	7	8.5	7	6	32.5	£243.75
5	K Brown	Office Junior	£7.50	8	8	8	8	0	32	£240.00
6	S Sloan	Office Junior	£7.50	8	6	8	7.5	8	37.5	£281.25
7	P McFall	Team Leader	£10.00	8	8	8	8	8	40	£400.00
8	I Murray	Office Junior	£7.50	4	4	4	4	4	20	£150.00
9	B Jones	Office Junior	£7.50	5	5.5	7	0	0	17.5	£131.25
10	E Jonston	Office Manager	£12.50	9	9	9	9	9	45	£562.50
11		Average	£8.44	6.7	6.7	7.6	6.4	5.4	32.8	
12										
13									Total Staff Pay	£2,290.00

What type of formatting has Jen applied to the data in column I to provide the highlighting described?

_____ [1]

(e) Cells D3 to H10 contain the hours each staff member works. Staff cannot work more than 9 hours per day.

Name a validation check which could be used in cells D3 to H10 to ensure the data entered is correct.

_____ [1]

(f) Jen will add a macro to allow her to print the spreadsheet when it is completed.

What is a macro?

_____

_____ [2]

8 **(a)** Protocols support data transfer over a network. Complete the table by matching the protocol types listed below with the appropriate use for that protocol.

<div align="center">

FTP   **HTTP**

</div>

Protocol Type	Use
	Used to transfer web pages across the Internet
	Used to send and receive files over the Internet

[2]

(b) Firewalls are used to protect computer networks. List **two** tasks carried out by a firewall.

1. _____

2. _____ [2]

(c) In the table below, circle the example of cybercrime which is being described.

Example of cybercrime			Description
Phishing	Spamming	Cyber defamation	Use of a digital communication application to obtain personal information from users
Phishing	Spamming	Cyber defamation	Use of a digital communication application to distribute damaging information about a user
Phishing	Spamming	Cyber defamation	Use of a digital communication application to overload the users inbox with unwanted content

[3]

(d) Describe how a worm virus can be used to disrupt the operation of a computer system.

_____

_____

_____

_____ [3]

9 Alex owns an online gaming business with offices across Northern Ireland. All software and data used by his company are stored in the cloud.

(a) Give **two** advantages of using cloud computing to store software and data.

1. _____

_____

2. _____

_____ [2]

(b) Give **two** disadvantages of using cloud computing to store software and data.

1. _____

_____

2. _____

_____ [2]

Many game developers now distribute games online.

(c) How has the online distribution of games helped the game developers and their customers?

Game developers _____

_____ [1]

Customers _____

_____ [1]

10 Kane's Kabs allow users to book taxis using a mobile phone app. They use GPS to provide users with additional information about the taxis they have ordered.

(a) What do the letters GPS stand for?

_____ [1]

(b) The mobile phone app automatically activates GPS on the user's smart phone.

Why might some users have a problem with this happening?

_____

_____ [1]

(c) The office staff in Kane's Kabs have reported a range of health problems associated with regular computer use. These are listed in the table below.

Complete the table by giving **one** way (apart from regular breaks) in which the health problem listed can be prevented.

Health problem	Method of preventing problem (Regular breaks cannot be used)
Back pain	[1]
RSI	[1]
Eye strain	[1]

11 Emma works mainly from home (teleworking).

(a) Apart from a computer, identify **two** digital technology devices she could use at home to log into her company's intranet to access work emails.

1. _____

2. _____ [2]

(b) List **two** advantages of teleworking to an employer.

1. _____

2. _____ [2]

12 Using the terms in the list below choose **one** term that best matches the definition in the left-hand column (not all terms will be used).

BLUETOOTH   **DEFRAGMENTING**   **SWITCH**

TASK SCHEDULING   **PROGRAM COUNTER**   **ROUTER**

Wi-Fi   **MEMORY DATA REGISTER**

Definition	Term
Part of the processor which holds the address of the next instruction to be executed.	[1]
A device which connects a number of networks together.	[1]
A short range wireless technology which allows two devices to connect for the purpose of communication.	[1]
A utility that rearranges data on a disk so that files are stored together in blocks, meaning they can be read more quickly.	[1]

THIS IS THE END OF THE QUESTION PAPER

BLANK PAGE

DO NOT WRITE ON THIS PAGE

DO NOT WRITE ON THIS PAGE

238909

28GDG1128