



**General Certificate of Secondary Education
2018**

Digital Technology

Unit 1:

(Compulsory Core)

Digital Technology

[GDG11]

THURSDAY 17 MAY, AFTERNOON

MARK SCHEME

1	(a)	C	Data is facts and figures which has not been processed and has no meaning.	[1]	8						
	(b)	C	nibble, byte, kilobyte, megabyte	[1]							
	(c)	B	A buffer is a memory location used to store a downloaded part of a video before it is watched.	[1]							
	(d)	B	Repetitive Strain Injury	[1]							
	(e)	A	Encryption allows data to be transferred securely and data can only be read with a key	[1]							
	(f)	C	Consumer Contracts Regulations	[1]							
	(g)	B	The person who makes the public aware of their rights under the Data Protection Act	[1]							
	(h)	B	HyperText Transfer Protocol Secure	[1]							
2	(a)	<table><tr><th>Field</th><th>Data Type</th></tr><tr><td>DateOfBirth</td><td>DATE/TIME or DATE [1]</td></tr><tr><td>JoiningFee</td><td>CURRENCY/Real(or equivalent) [1]</td></tr></table>			Field	Data Type	DateOfBirth	DATE/TIME or DATE [1]	JoiningFee	CURRENCY/Real(or equivalent) [1]	
	Field	Data Type									
	DateOfBirth	DATE/TIME or DATE [1]									
	JoiningFee	CURRENCY/Real(or equivalent) [1]									
	(b)	Uniquely identifies a record/member/individual [1]									
(c)	One to Many [1]										
(d)	Any one from: So they know who to send the newsletter to [1] To store which Newsletters each member receives [1] To store a list of members and the newsletters they receive [1] To provide a link between the member and newsletter table [1] [1]										
				5							

- 3 (a) Any **two** from:
 The application of algorithms/programs/software to data to identify patterns/ trends/relationships [1]
 Can include statistical analysis [1] or AI [1]
 Analysing data to draw conclusions [1] [2]

- (b) **Level 0 ([0])**
 Answer not worthy of credit

Level 1 ([1]–[2])

The candidate describes one volume, velocity, variety, big data or gives an appropriate example. The candidate makes limited use of spelling, punctuation and grammar. The meaning of the text is not always clear. The candidate demonstrates a limited form and style appropriate to the question. The organisation of the answer is limited. There is little use of specialist terms.

Level 2 ([3]–[4])

The candidate describes two or three volume, velocity, variety, big data or gives an appropriate example. The candidate makes satisfactory use of spelling, punctuation and grammar. The meaning of the text is usually clear. The candidate demonstrates a satisfactory form and style appropriate to the question. The organisation of the answer is satisfactory. There is some use of specialist terms.

Level 3 ([5]–[6])

The candidate describes four or five volume, velocity, variety, big data or an appropriate example. The candidate makes good use of spelling, punctuation and grammar. The meaning of the text is always clear. The candidate demonstrates good form and style appropriate to the question. The organisation of the answer is good. There is good use of specialist terms.

Answers may include reference to:

- Description of big data must reference the fact that big data cannot be analysed by normal means.
- The effective management of the volume, velocity and variety of all this data is an important challenge for the big data industry.
- Volume – large data sets that are so complex that traditional tools, such as relational database management systems, are not able to deal with them effectively.
- Velocity – problems related to the real time flow of data. With a suitable example. How fast data is coming in. Speed of data processing. Incoming rate can be extremely high.
- Variety – the data produced is unstructured and comes in various forms and formats. The challenge is to store the data in a structured format.

Reference to data sources such as:

- text, images and videos uploaded to social media sites;
- medical records;
- fitness monitors;
- financial markets – share price data, currencies, etc.;
- web server logs;
- mobile phone records;
- ecommerce transactions;
- device logs (internet of things).

[6]

AVAILABLE
MARKS

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- 4 (a) (i) Any **two** from
 Smallest unit of an image [1]/that can be edited/displayed [1]
 Each pixel can have its own colour [1]
 When combined together pixels form an image/Bitmap image is made up of pixels [1]
 Each pixel is stored as a series of binary digits [1] [2]

- (ii) Any **two** from:
 resolution is (a measure of) the quality of the image/pixels per inch/number of pixels [1]
 the higher/lower the resolution the better/worse quality the image will be [1] high/low resolution images need more/less storage space (or contain more/less pixels) [1] [2]

(b) (i)

File Format	Description
 logo PNG image 52.1 KB	Portable Network Graphics [1]
 logo JPEG image 14.4 KB	Joint Photographic Experts Groups [1]

[2]

- (ii) Any **two** from:
 The jpeg is a compressed file format. [1]/The jpeg contains less pixels [1]
 The bitmap graphic is not compressed [1]
 Compressed file formats contain less detail/(unnecessary) detail removed/or are of reduced quality [1]
 Reference to lossy or lossless compression [1]
 Each pixel's colour code has to be stored [1] [2]

- (iii) Any **one** from:
 Stores information about components/shapes that make up the image [1]
 The image is made up of objects/defined by mathematical equations [1]
 The file contains instruction on how the image should be re-drawn [1]
 The file size of the image is comparatively smaller than a similar sized bitmap image [1]
 Vector-based graphic can be re-sized without loss of quality [1]
 Objects can be edited (individually) [1]
 Does not depend on image resolution [1] [1]

5 (a) (i)	Processor component	Value
	Clock Speed	2.5 GHz/3.1GHz [1]
	Cache size	3 MB [1]
	Number of cores	2 (dual not accepted) [1]

[3]

- (ii) Any **one** from:
 Influences the speed at which CPU executes commands [1]
 The greater the clock speed the greater the processing power [1]
 Higher the clock speed the more instruction cycles can be carried out per second [1]
 Higher the clock speed – better performance/quicker the CPU will work [1]
 [1]

- (iii) Any **two** from:
 Solid State (Drive) [1]
 No moving parts [1]/storage embedded as part of an electronic circuit [1]
 Flash memory [1]
 Non-volatile [1]
 Does not need to be defragmented [1]
 Faster than a traditional/magnetic hard drive [1]
 [2]

- (b) (i) Any **two** from:
 Storage (devices)/(data) storage [1]
 Processor time [1]
 Hardware [1]
 Software [1]
 [2]

- (ii) Any **three** from:
 A free space in memory/RAM is located [1]
 The free space is allocated to the data/program [1]
 The program/data is transferred back out of main memory when no longer required [1]
 [3]

- (c) Collecting groups of similar data over time and processing the data together is called **batch processing** [1]. This type of processing is suitable for **billing systems** [1]. Processing data immediately as it is collected is called **real-time processing** [1]. This type of processing is suitable for **airline booking systems** [1].
 [4]

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- 6 (a)** Any **two** from:
 User activities are limited by levels of access [1]
 Suitable example, e.g. Student V Teacher access rights in school [1]
 Access rights/levels can be classified as 'read only'/'read and copy'/'read and write' [1]
 Data/files can be allocated access rights/levels/require access privileges for access [1] [2]

- (b) Level 0 ([0])**
 Answer is not worthy of credit.

Level 1 ([1])

The candidate describes briefly how computers are organised on a star network or describes briefly the role of the file server but provides little or no expansion on either point. The candidate makes limited use of spelling, punctuation and grammar. The meaning of the text is not always clear. The candidate demonstrates a limited form and style appropriate to the question and little or no evaluation is present. The organisation of the answer is limited.

Level 2 ([2]–[3])

The candidate describes how computers are organised on a star network and describes the role of the file server. The candidate makes satisfactory use of spelling, punctuation and grammar. The meaning of the text is usually clear. The candidate demonstrates a satisfactory form and style appropriate to the question. The organisation of the answer is satisfactory.

Level 3 ([4])

The candidate describes fully how computers are organised on a star network and the role of the file server or the network. The candidate makes good use of spelling, punctuation and grammar. The meaning of the text is usually clear. The candidate demonstrates a good form and style appropriate to the question. The organisation of the answer is good.

Answers may include

How computers are organised on a star network:

- Computers are connected (by their own cable) to the central file server in a star structure.
- If a cable fails it will only affect the computer it is connected to and the rest of the network will operate as normal.
- An additional computer can be added by attaching it using its own cable to the file server.
- A labelled diagram is acceptable with a brief explanation.
- All data on the network must pass through the file server.
- Reference to the fact that the server must be high powered.
- File server stores data/software/provides services to the network/ manages user access/manages security/manages peripherals/manages resources/allows users to share information/manages backup.
- Centralised updates. [4]

- 7 (a) Merge cells [1]
- (b) SUM [1]
- (c) (i)
- | VLOOKUP | Tick [✓] |
|-------------------------------|----------|
| =VLOOKUP(B3, \$L\$3:\$M\$5,1) | |
| =VLOOKUP(B3, \$L\$3:\$M\$5,2) | ✓ [1] |
| =VLOOKUP(C3, L3:M5,1) | |
| =VLOOKUP(C3, L3:M5,2) | |
- [1]
- (ii) Data changed on the VLOOKUP table will automatically update the linked cells on the spreadsheet.
Puts in rate of pay automatically [1] [1]
- (iii) Cell reference stays the same [1] when the formula is copied/replicated [1] [2]
- (d) Conditional formatting [1]
- (e) Range check [1]
- (f) Short cut to a task/program/set of instructions/set of commands/set of actions [1]
Automatically carry out repetitive tasks/click to carry out repetitive task [1] [2]

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8	(a)	Protocol Type	Use	[2]
		HTTP[1]	Used to transfer web pages across the internet	
		FTP[1]	Used to send and receive files over the internet	

- (b) Any **two** from:
 stops upload/download of unauthorised data/controls/monitors data entering/leaving (network) [1]
 prevents hackers from gaining access [1]
 prevents spam and viruses from entering/leaving [1]
 can provide information on unauthorised access [1]

(c)

Example of cyber crime	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

- (d) Any **three** from:
 Spreads/replicates itself around computer/network [1]
 does not need to be attached to a file/does not need a host file [1]
 takes up hard drive storage space/memory space [1]
 attaches to data being transmitted [1]
 can slow down data transmission/network [1]
 examples delete files/sends emails/damages files

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- 9 (a) Any **two** from:
 Cost effective [1]
 Unlimited storage [1]
 Immediate availability of software updates [1]
 Responsibility for backup and recovery is with the online provider [1]
 Information can be accessed from anywhere **with Internet access** [1]
 Promotes file sharing [1]
 Reduced carbon footprint [1]
 Can be adapted to the organisation's need [1] [2]

- (b) Any **two** from:
 Some providers limit bandwidth/storage space allowance/cost of increasing bandwidth allowance can be high [1]
 Reliance on cloud providers technology [1]
 Reliance upon broadband providers technology [1]
 Security concerns/hacking [1]
 Additional customer support required in event of difficulty [1] [2]

- (c) Game developers
 Any **one** from: increased customer base/reduction in possibility of piracy/
 reduced cost of distribution/possible increased sales/24/7 sales [1]

 Customer
 Any **one** from: immediate availability of game/updates immediately available/
 reduced price of game/don't have to worry about damaging portable
 storage media [1]
 Don't have to go to shops/can buy at home [1] [2]

- 10 (a) Global Positioning System [1]
 (b) Their location is available to other app users/concerned about security/invasion of privacy [1]

(c)

Health problem	Method of preventing problem (regular breaks cannot be used)
Back pain	Adjustable chairs/consideration of posture [1]
RSI	Use ergonomic hardware/furniture/use of wrist rests/use of foot rests [1]
Eye strain	Use anti-glare screens/use screens which can be tilted/adjust brightness/appropriate lighting in office/regular eye tests/description of a method which will reduce glare [1]

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- 11 (a)** Any **two** from
 smart/mobile phone (not 'phone') [1]
 Tablet/laptop/iPad [1]
Smart tv [1]
 Digital gaming device [1]
 Smart watch [1]

[2]

- (b)** Any **two** from:
 No need to pay rent for work premises [1]/reduced overheads/travel expenses [1]
 No geographical restriction on staff recruitment [1]

[2]

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

[4]

4

Total

90