GCSE Computing

Revision Pack

TWO

Data Representation
Questions

Name:

/113

Attempt One   %
Attempt Two   %
Attempt Three   %

Areas of Strength   Areas for Development

1.
Explain how ASCII is used to represent text in a computer system. (3 marks)

2.
State what is meant by the character set of a computer. (1 mark)

3.
Unicode is also used to represent text in a computer system. Explain the difference between the character sets of Unicode and ASCII. (2 marks)

4.
A list of file extensions for common file standards used on the internet is shown below.
JPG PDF MP3 MPEG ZIP
The rock band allows some files to be downloaded by fans.
Complete the table below to show which file format **from the list given above** may be used for each of the following files. (5 marks)

File	File Format
A high resolution image of the band to use as a desktop background.	
Sheet music of their songs ready to be printed in the correct format for guitar players.	
A short video extract from their latest concert tour.	
A compressed collection of 200 plain text files containing the lyrics of all their songs.	
An audio recording of a song from their album.	

5.
Some of the file formats use compression. Explain the importance of compressing files when transmitting them via the internet. (2 marks)

6.
Describe the difference between lossy and lossless compression and give an example where each would be used. (4 marks)

7.
Convert the hexadecimal number 6A to denary. (2 marks)

8.
Convert the hexadecimal number 6A to binary. (2 marks)

9.
Convert the binary number 00111101 to hexadecimal. (2 marks)

10.
Explain why hexadecimal numbers are often used to represent binary numbers. (2 marks)

11.
State what is meant by a bit and a byte (2 marks)

12.
A file contains 5120 bytes. Calculate the size of the file in kilobytes. (2 marks)

13.
An artist is recording sound using a computer. The graph below represents the pressure wave of the sound being recorded.
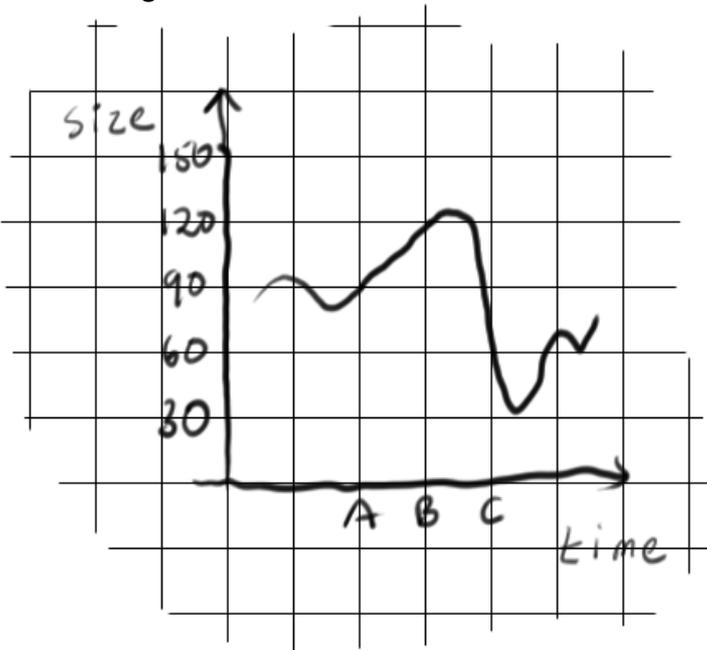
At point A on the graph, the size of the sound wave is 90. This is stored digitally using the binary value of 0101 1010 (or 5A in Hex). Complete the table below to show how points B and C are stored: (6 marks)

	Point A	Point B	Point C
Size	90		
Binary Value	0101 1010		
Hex Value	5A		

14.
Explain how sampling intervals and compression can affect the size of a sound file and the quality of its playback. (8 marks)

15.
Bytes, Kilobytes and Megabytes are units used for the amount of data stored in a computer. State which of these units is most appropriate for the following items of data.
A one page text document
A ten minute movie clip:
A person's surname:
(3 marks)

16.
A computer has a hard disk of 2 Terabytes. How much is this in Gigabytes? (2 marks)

17.

Peter takes a picture of himself and his friends to put on a social networking site. The picture is converted into pixels and stored as a bitmap file. Tick one box in each row to show whether or not each of the following items must be included in the bitmap file. (5 marks)

	Must be included	Need **not** be included
The names of the people in the picture		
The width of the picture in pixels		
The number of bits used for each pixel		
The number of people in the picture		
The colour of each pixel		

18.

What is meant by the resolution of the picture? (1 mark)

19.

How does the resolution affect the size of the bitmap file? (2 marks)

20.

Convert the denary number 106 into an 8 bit binary number. (2 marks)

21.

Convert the denary number 106 into Hexadecimal. (2 marks)

22.

Peter takes a high-resolution picture with a digital camera. The picture is stored in a bitmap file. Describe how a picture is stored in a bitmap file. (3 marks)

23.

Peter wants to send the picture as an email attachment. State **two** methods for reducing the size of the picture file so that it is suitable for sending as an email. (2 marks)

24.

The table below shows different standard file formats that are used to transmit media files on the internet. Tick one box in each row to show whether the format is used to transmit an image file, a sound file or a video file. (3 marks)

	image file	sound file	video file
AVI			
BMP			
JPG			
MP3			

25.

Convert the denary number 55 to an 8 bit binary number. (2 marks)

26.

Convert the denary number 55 to hexadecimal. (2 marks)

27.

The memory of a computer contains data and instructions in binary. Explain why computers use binary. (2 marks)

28.
Describe how instructions are stored in binary. (3 marks)

29.
Add the following bytes.
11011000 + 01100000
(2 marks)

30.
State the problem that will occur if a computer is to store the result as a byte (1 mark)

31.
A website is made up of different types of files.State what each of the file types in the table below is used for. (4 marks)

File type	Use
HTML	
JPG	
MP3	
PDF	

32.
When recording a sound file on a computer, the sound needs to be sampled.
Describe how sampling is used when storing sound. (2 marks)

33.
Explain the effect of the sampling interval on the size and quality of the sound file recorded. (3 marks)

34.
In the ASCII character set, the character codes for the first three capital letters are given below.
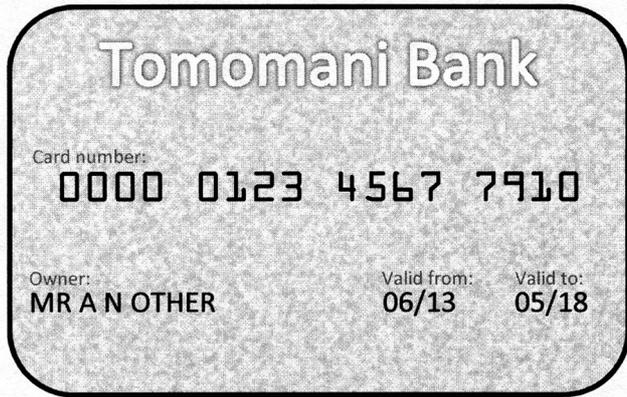
Letter	ASCII character code
A	0100 0001
B	0100 0010
C	0100 0011

Convert the word CAB into binary using the ASCII character set. (1 mark)

35.
Explain why the ASCII character set is not suitable for representing text in all the languages of the world. (2 marks)

36.
When customers pay using a card such as the one below, shops use computer systems to process the payment.

Tick one box in each row, to show which of the data types given is the most appropriate data type for each of the following data items. (3 marks)

37.
The video clip is compressed using lossy compression.Explain why lossy compression is suitable for a video clip, but not suitable for a text document. (3 marks)

38.
A microwave oven is controlled by a small, specially built CPU. The table below shows some CPU instructions and what they mean.

CPU instruction	Meaning
00001000 00010100	Add 20 to the timer
00001000 00000001	Add 1 to the timer
00000100 00000001	Subtract 1 from the timer

Using examples from the instructions above, state what is meant by an opcode and an operand (4 marks)

39.
Convert the hexadecimal number 1F64A to binary. (5 marks)

40.
Explain why mobile phones that can send emoji would use Unicode instead of ASCII as their character set. (2 marks)

41.
Explain how reducing the number of colours in an image can reduce its file size. (2 marks)

42.
The final image file may contain metadata. Describe, using an example, what is meant by metadata. (2 marks)