Binary, Data and Logic

Standard difficulty · 20 questions · 40 marks · Time: 37 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. A bit is:

(a) a letter **(b)** 1,024 bytes
(c) 8 binary digits **(d)** a single binary digit, 0 or 1

2. What is the binary number 11110011 in decimal?

(a) 243 **(b)** 207 **(c)** 242 **(d)** 244

3. What is 217 in binary?

(a) 11011000 **(b)** 10011011 **(c)** 11011001 **(d)** 111011001

4. How many bytes are there in 20 KB? (1 KB = 1,024 bytes)

(a) 160 **(b)** 163,840 **(c)** 20,000 **(d)** 20,480

5. A picture is 264 × 176 pixels, and each pixel uses 1 bit. How many bytes does the picture need, before any compression?

(a) 5,808 **(b)** 726 **(c)** 46,464 **(d)** 11,616

6. In ASCII, A is 65, B is 66, C is 67, and so on. Which letter has the code 76?

(a) M **(b)** Y **(c)** L **(d)** Q

7. In a truth table for NOT (A OR B) with inputs A, B and C (8 rows), in how many rows is the result True?

(a) 1 **(b)** 3 **(c)** 2 **(d)** 6

8. What is the largest whole number that 2 bits can store?

(a) 3 **(b)** 5 **(c)** 4 **(d)** 2

Section B — Short answer — 8 × 2 = 16 marks

9. Why do computers use binary?

10. Write 236 in binary.

11. A 96 × 416 pixel image uses 24 bits per pixel. How many bytes does it take?

12. A = True, B = True, C = False. Is (A AND B) OR (NOT C) True or False?

13. In ASCII, A is 65, B is 66, and so on up to Z = 90. Decode the word: 71 65 77 69

14. What is the fewest bits needed to give 1,635 different items their own binary code?

15. Add the binary numbers 1001000 and 100110, and give the answer in binary.

16. With inputs A, B and C (8 rows), in how many rows is (a) A OR (B AND C) True (b) (A AND B) OR (NOT C) True?

Section C — Word problems — 4 × 4 = 16 marks

17. Explain how numbers, text and images are all stored as binary in a computer.

18. A photo is 544 pixels wide and 576 pixels high, with 8 bits per pixel. (a) How many pixels are there? (b) How many bits does the photo need? (c) How many bytes? (d) How many KB (1 KB = 1,024 bytes)?

19. For A = False, B = False, C = False: (a) is (A AND B) OR (NOT C) True or False? (b) is A OR (B AND C) True or False? (c) Over all 8 rows of the truth table, in how many rows is (A AND B) OR (NOT C) True?

20. A text message has 307 characters, and each character is stored in 1 byte. (a) How many bytes does it use? (b) How many bits? (c) How many such messages fit in 2 KB (1 KB = 1,024 bytes)?

Want another sheet on this chapter? In the Ambiful Worksheets app every sheet is new, with its answer key, and your child never gets the same question twice.

Scan the code to get the free app, or open **worksheets.ambiful.com/get**

Answer key

Binary, Data and Logic · AW-9CT-BDL-2026-V1 · For parents — fold back or tear off before handing the sheet to your child.

Q	Answer	Working
1	**(d) a single binary digit, 0 or 1**	—
2	**(a) 243**	128 + 64 + 32 + 16 + 2 + 1
3	**(c) 11011001**	repeated division by 2, remainders read upwards
4	**(d) 20,480**	20 × 1,024
5	**(a) 5,808**	264 × 176 × 1 ÷ 8
6	**(c) L**	76 − 65 = 11 letters after A
7	**(c) 2**	000, 001
8	**(a) 3**	$2^2 - 1$
9	**Their circuits have two states (on/off), which match the digits 1 and 0.**	—
10	**11101100**	128 + 64 + 32 + 8 + 4
11	**119,808**	96 × 416 × 24 ÷ 8
12	**True**	(True AND True) OR (NOT False) = True OR True = True
13	**GAME**	71 = G, 65 = A, 77 = M, 69 = E
14	**11**	$2^{10} = 1{,}024 < 1{,}635 \leq 2^{11} = 2{,}048$
15	**1101110**	72 + 38 = 110
16	**(a) 5; (b) 5**	list the 8 rows 000 to 111
17	**Numbers are written in base 2; each character gets a code (A = 65) stored in binary; an image is a grid of pixels, each colour stored as a binary number.**	—
18	**(a) 313,344; (b) 2,506,752; (c) 313,344; (d) 306**	544 × 576; × 8; ÷ 8; ÷ 1,024
19	**(a) True; (b) False; (c) 5**	(a) (False AND False) OR (NOT False) = False OR True = True (b) False OR (False AND False) = False OR False = False
20	**(a) 307; (b) 2,456; (c) 6**	2 × 1,024 = 2,048 bytes; ÷ 307, whole messages only

Ambiful Worksheets · worksheets.ambiful.com · Not affiliated with CBSE / NCERT