

DATA REPRESENTATION

COMPUTER SCIENCE

MAXIMUM MARKS : 70

NAME

DATE

SIGNATURE.....

SECTION A: MULTIPLE CHOICE (EASY) – 15 MARKS

Answer ALL questions. (1 mark each)

1. Which number system uses base 2?

- A. Denary
- B. Binary
- C. Hexadecimal
- D. Octal

2. How many bits are in 1 byte?

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3. What is the largest value in 8-bit unsigned binary?

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4. Which of these is base 16?

- A. 100
- B. 127

C. B33DA

D. 10010011

5. Which unit is largest?

A. KB

B. MB

C. GB

D. Byte

6. What does ASCII represent?

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7. How many bits are used in standard ASCII?

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8. What does “lossy compression” mean?

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9. Which colour model uses Red, Green, Blue?

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10. What is 1010 in denary?

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11. What does "sampling rate" refer to?

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12. Which binary number format stores negative numbers?

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13. What is overflow?

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14. Which is smallest: bit, byte, nibble?

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15. What is resolution?

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SECTION B: SHORT ANSWER (MEDIUM) – 46 MARKS

Question 1: Number Systems (12 marks)

a) Convert 110101_2 to denary

.....[4]

b) Convert 59_{10} to binary

..... [4]

c) Convert $3F_{16}$ to denary

.....[4]

Question 2: Binary Arithmetic (10 marks)

a) Add:

101101
+ 011011

.....[5]

b) Subtract using two's complement:

101000 - 001110

.....[5]

Question 3: Text Representation (10 marks)

a) Explain ASCII. [3]

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b) State two limitations of ASCII. [2]

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c) Explain Unicode. [3]

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d) Give two advantages of Unicode. [2]

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Question 4: Images (14 marks)

a) Define bitmap image. [3]

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b) Explain resolution. [3]
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c) Explain colour depth. [3]
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d) Calculate file size of image which:
is 400×300 pixels and
has 24-bit colour depth

.....[5]

SECTION C: STRUCTURED & APPLIED (HARD) – 9 MARKS

Question 5: Storage & Representation (9 marks)

A school records exam marks using 8-bit binary.

- a) State maximum mark possible. [2]

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- b) Explain why overflow may occur. [3]

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- c) Suggest two solutions. [4]

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