

1. (a) (i) Outline **two** properties of *mode* as used in statistics. (2 marks)

- (ii) Differentiate between the following matrices. (4 marks)

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad \wedge \quad B = \begin{pmatrix} 5 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 7 \end{pmatrix}$$

- (b) Explain **three** reasons that may necessitate the use of *Gray codes* as applied in computers. (6 marks)

- (c) The length of a rectangular field is 10 metres less than three times the width. The perimeter of the field is 940 metres. Determine the length and the width of the field. (4 marks)

- (d) Outline **two** advantages and **two** disadvantages of using *graphs* in data representation. (4 marks)

2. (a) (i) Outline **four** desired qualities of statistical units as used in data collection. (4 marks)

Use the tree diagram to determine the following;

- (i) a user successfully logs on in each of the first three attempt;(1 mark)

- (ii) a user fails in the first attempt but is successful in the next two attempts; (1 mark)

- (iii) a user logs on successfully only once in the last attempt; (1 mark)

- (iv) a user doesn't log on successfully in the three attempts. (1 mark)

3. (a) Distinguish between a *frequency polygon* and an *ogive* as used in data representation. (4 marks)

- (b) Differentiate between *absolute* and *relative* measure as used in measures of dispersion. (4 marks)

- (c) (i) Dixy College conducted the end of term examinations where 25% of the students failed in mathematics; 15% failed in chemistry and 10% failed in both mathematics and chemistry. Determine the probability that a student selected at random will have passed in mathematics and chemistry (5 marks)

- (ii) Perform the following binary arithmetic.

$$10110101 + 110011 - 11101$$

(3 marks)

- (d) Distinguish between *spatial* and *statistical* models as used in statistics.

(4 marks)

4. (a) (i) List six sources of *secondary data* as applied in statistics. (3 marks)

(ii) Using *matrices* solve the following simultaneous equation. (2 marks)

$$3x + y = 3$$

$$x + 2y = 7$$

(b) (i) Explain two characteristics of *standard deviation* as a measure of dispersion. (4 marks)

(ii) Explain each of the following terms as applied in binary codes:

I. weighted binary codes; (2 marks)

II. reflective codes. (2 marks)
