

The following summary statistics were calculated from these data.

$$\sum l=4027 \quad \sum l^2=327\,754.5 \quad \sum w=357.1 \quad \sum lw=29\,330.5 \quad S_{ww}=289.6$$

- (a) Find S_{ll} and S_{lw} (3)
- (b) Calculate, to 3 significant figures, the product moment correlation coefficient between l and w . (2)
- (c) Give an interpretation of your coefficient. (1)



Q1

(Total 6 marks)



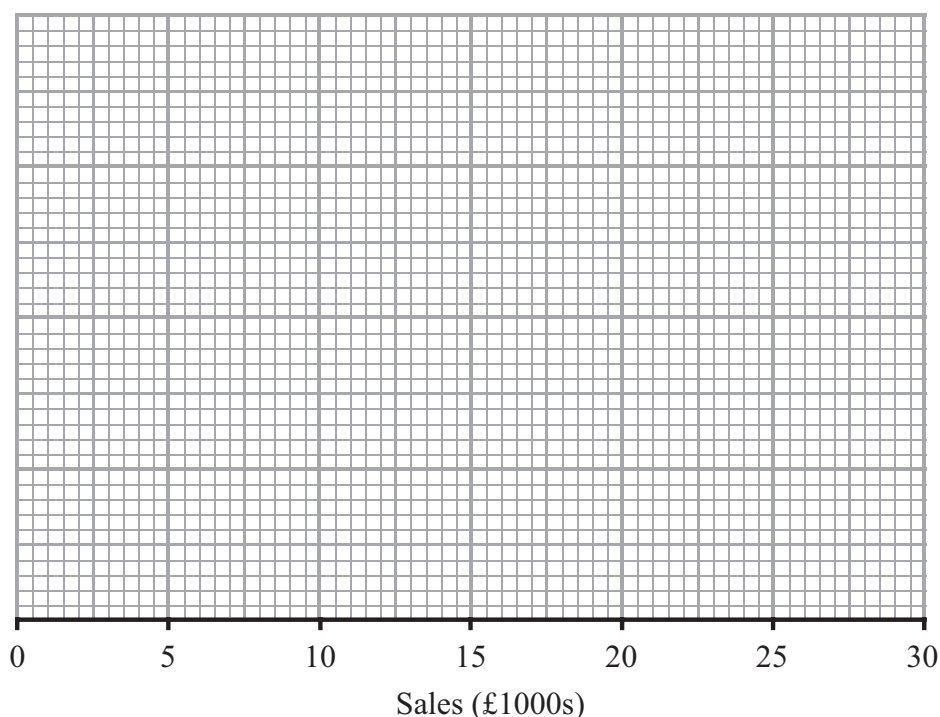
3. Over a long period of time a small company recorded the amount it received in sales per month. The results are summarised below.

	Amount received in sales (£1000s)
Two lowest values	3, 4
Lower quartile	7
Median	12
Upper quartile	14
Two highest values	20, 25

An outlier is an observation that falls either $1.5 \times$ interquartile range above the upper quartile or $1.5 \times$ interquartile range below the lower quartile.

- (a) On the graph paper below, draw a box plot to represent these data, indicating clearly any outliers.

(5)



- (b) State the skewness of the distribution of the amount of sales received. Justify your answer.

(2)

- (c) The company claims that for 75 % of the months, the amount received per month is greater than £10 000. Comment on this claim, giving a reason for your answer.

(2)



Q3

(Total 9 marks)



$$S_{vv} = 5.753 \quad S_{vv} = 1.688 \quad S_{vv} = 1.168 \quad \bar{p} = 3.22 \quad \bar{v} = 4.42$$

- (b) Using your regression line estimate the annual yield of peas per acre when the annual rainfall is 85 cm.

(2)

Time, t	Number of students
10 – 19	2
20 – 29	4
30 – 39	8
40 – 49	11
50 – 69	5
70 – 79	2

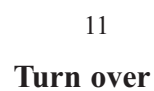
- (2)

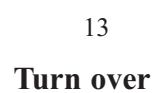
$$\sum t = 1414 \quad \text{and} \quad \sum t^2 = 69378$$

- (3)

- (2)

(Total 7 marks)



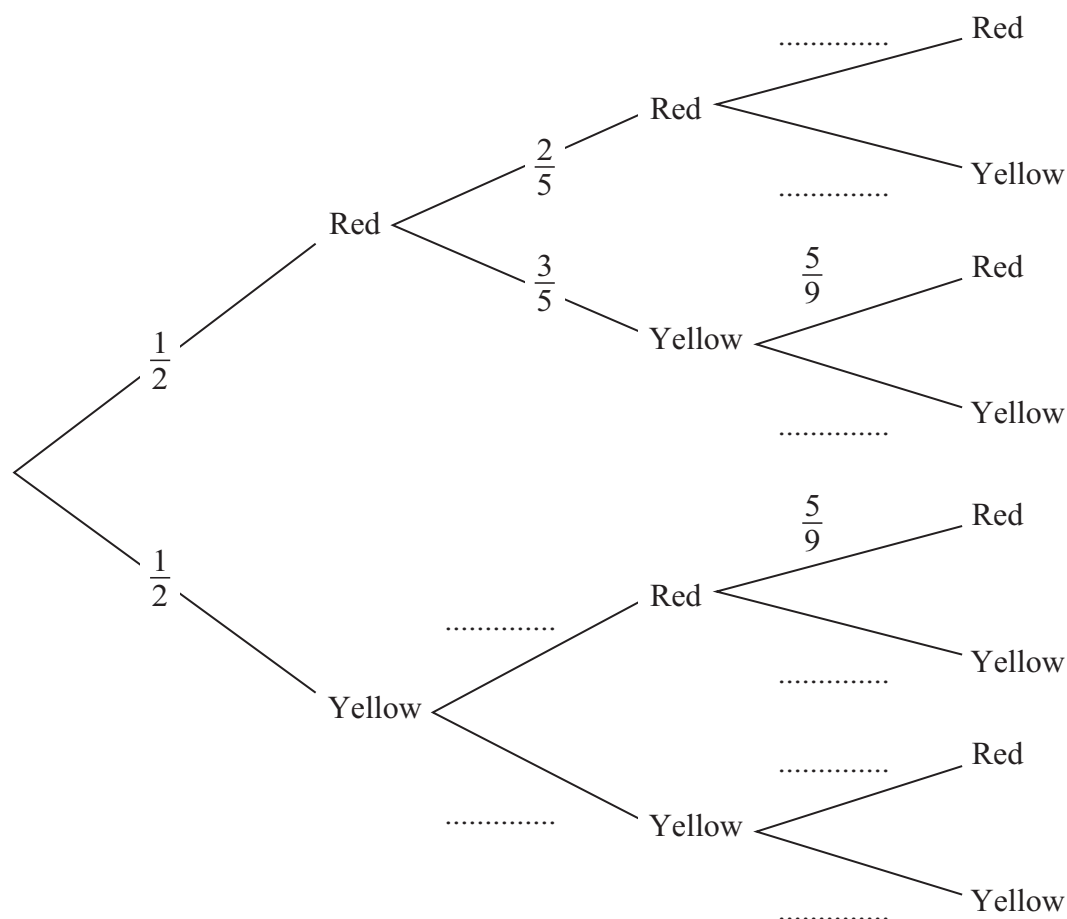


7. The bag P contains 6 balls of which 3 are red and 3 are yellow.
The bag Q contains 7 balls of which 4 are red and 3 are yellow.
A ball is drawn at random from bag P and placed in bag Q . A second ball is drawn at random from bag P and placed in bag Q .
A third ball is then drawn at random from the 9 balls in bag Q .

The event A occurs when the 2 balls drawn from bag P are of the same colour.
The event B occurs when the ball drawn from bag Q is red.

- (a) Complete the tree diagram shown below.

(4)



- (b) Find $P(A)$

(3)

- (c) Show that $P(B) = \frac{5}{9}$

(3)

- (d) Show that $P(A \cap B) = \frac{2}{9}$

(2)

- (e) Hence find $P(A \cup B)$

(2)

- (f) Given that all three balls drawn are the same colour, find the probability that they are all red.

(3)





Question 8 continued

(Total 12 marks)

TOTAL FOR PAPER: 75 MARKS

END

