

SECTION A: STATISTICS

Answer ALL questions. Write your answers in the spaces provided.

1. A company is introducing a job evaluation scheme. Points (x) will be awarded to each job based on the qualifications and skills needed and the level of responsibility. Pay (£ y) will then be allocated to each job according to the number of points awarded.

Before the scheme is introduced, a random sample of 8 employees was taken and the linear regression equation of pay on points was $y = 4.5x - 47$

- (a) Describe the correlation between points and pay. (1)
- (b) Give an interpretation of the gradient of this regression line. (1)
- (c) Explain why this model might not be appropriate for all jobs in the company. (1)

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2. A factory buys 10% of its components from supplier A , 30% from supplier B and the rest from supplier C . It is known that 6% of the components it buys are faulty.

Of the components bought from supplier A , 9% are faulty and of the components bought from supplier B , 3% are faulty.

- (a) Find the percentage of components bought from supplier C that are faulty.

(3)

A component is selected at random.

- (b) Explain why the event “the component was bought from supplier B ” is not statistically independent from the event “the component is faulty”.

(1)



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3. Naasir is playing a game with two friends. The game is designed to be a game of chance so that the probability of Naasir winning each game is $\frac{1}{3}$

Naasir and his friends play the game 15 times.

- (a) Find the probability that Naasir wins

- (i) exactly 2 games,
(ii) more than 5 games.

(3)

Naasir claims he has a method to help him win more than $\frac{1}{3}$ of the games. To test this claim, the three of them played the game again 32 times and Naasir won 16 of these games.

- (b) Stating your hypotheses clearly, test Naasir's claim at the 5% level of significance.

(4)



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Question 3 continued

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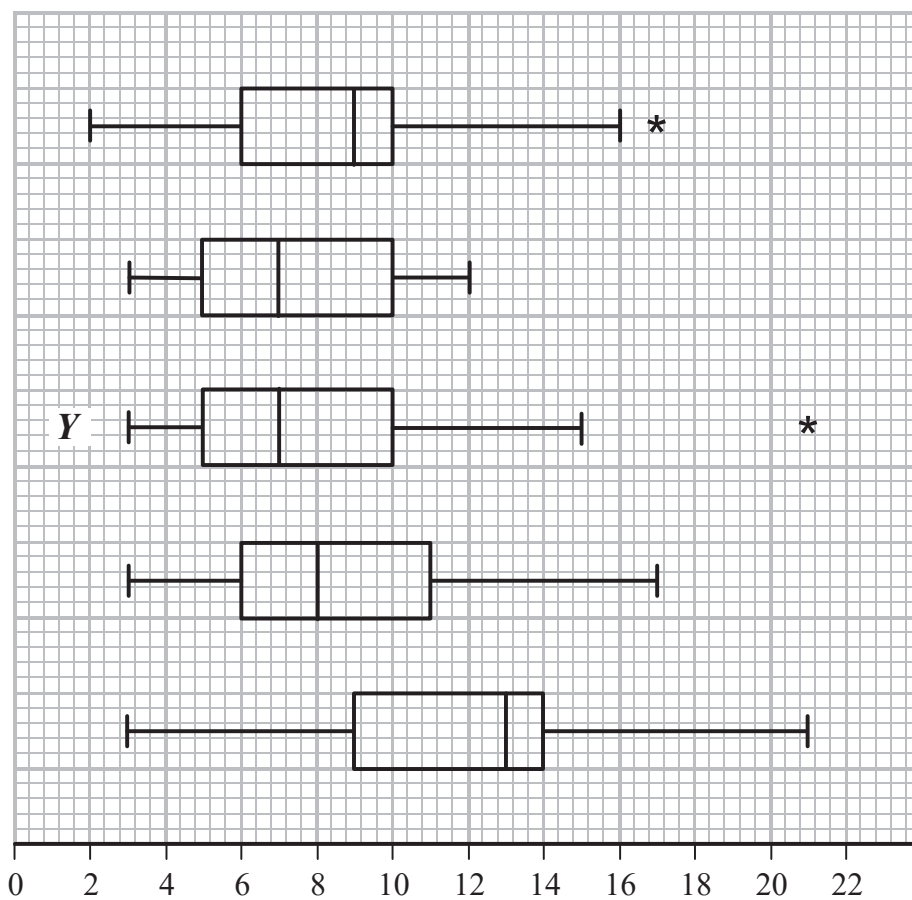
Question 3 continued

Lined area for writing answers.

(Total for Question 3 is 7 marks)



Question 4 continued



(Total for Question 4 is 8 marks)



5. A biased spinner can only land on one of the numbers 1, 2, 3 or 4. The random variable X represents the number that the spinner lands on after a single spin and $P(X = r) = P(X = r + 2)$ for $r = 1, 2$

Given that $P(X = 2) = 0.35$

- (a) find the complete probability distribution of X .

(2)

Ambroh spins the spinner 60 times.

- (b) Find the probability that more than half of the spins land on the number 4
Give your answer to 3 significant figures.

(3)

The random variable $Y = \frac{12}{X}$

- (c) Find $P(Y - X \leq 4)$

(3)



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Question 5 continued

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