

Edexcel Maths S2

Topic Questions from Papers

Population & Samples



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1. Before introducing a new rule the secretary of a golf club decided to find out how members might react to this rule.

(a) Explain why the secretary decided to take a random sample of club members rather than ask all the members. (1)

(b) Suggest a suitable sampling frame. (1)

(c) Identify the sampling units. (1)

Handwritten answer area with horizontal lines. The text "(Total 3 marks)" is written at the bottom right of this area.

**Q1**

**(Total 3 marks)**









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3. A random sample  $X_1, X_2, \dots, X_n$  is taken from a population with unknown mean  $\mu$  and unknown variance  $\sigma^2$ . A statistic  $Y$  is based on this sample.

(a) Explain what you understand by the statistic  $Y$ . (2)

(b) Explain what you understand by the sampling distribution of  $Y$ . (1)

(c) State, giving a reason which of the following is **not** a statistic based on this sample.

(i)  $\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n}$       (ii)  $\sum_{i=1}^n \left(\frac{X_i - \mu}{\sigma}\right)^2$       (iii)  $\sum_{i=1}^n X_i^2$  (2)

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6. A bag contains a large number of balls.

65% are numbered 1

35% are numbered 2

A random sample of 3 balls is taken from the bag.

Find the sampling distribution for the range of the numbers on the 3 selected balls.

(6)

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1. A bag contains a large number of 1p, 2p and 5p coins.

- 50% are 1p coins
- 20% are 2p coins
- 30% are 5p coins

A random sample of 3 coins is chosen from the bag.

(a) List all the possible samples of size 3 with median 5p. (2)

(b) Find the probability that the median value of the sample is 5p. (4)

(c) Find the sampling distribution of the median of samples of size 3 (5)

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