3. (a) Explain what you understand by the sampling distribution of a statistic.

(1)

A bag contains a large number of £1 coins and a large number of £2 coins only.

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

(b) List all the possible combinations of the 3 coins that might be selected.

(2)

The probability of selecting a £1 coin from the bag is p and the probability of selecting a £2 coin from the bag is q

Let $\overline{X}$ represent the mean value of the 3 coins selected.

The sampling distribution of $\overline{X}$ is given below

$\overline{x}$	1	$\frac{4}{3}$	a	2
$P(\overline{X} = \overline{x})$	$\frac{27}{125}$	b	c	d

where a, b, c and d are constants.

(c) State the value of a

(1)

(d) Find the value of b, the value of c and the value of d

(6)

Let M represent the modal value of the 3 coins selected.

(e) Find the sampling distribution of M

(3)

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Question 3 continued

(Total for Question 3 is 13 marks)