Q1.   A factory makes 600 laptops.
Mrs Green is responsible for checking these laptops.
She is going to take a random sample of 80 of the laptops.

(a)   Describe a method she could use to select the sample.

....

....

(1)

Mrs Green finds that 3 of the 80 laptops are faulty.

(b)   Work out an estimate for how many of the 600 laptops are faulty.

....

(2)
(Total 3 marks)

Q2.   The probability that a seed will grow into a flower is 0.85.
Loren plants 800 seeds.

Work out an estimate for the number of these seeds that will grow into flowers.

....
(Total 2 marks)

Q3.

| **Angling Chronicle** |
| :--- |
| Anglers dismayed at falling fish numbers! |

A scientist wants to estimate the number of fish in a lake.
He catches 50 fish from the lake and marks them with a dye.
The fish are then returned to the lake.
The next day the scientist catches another 50 fish.
4 of these fish are marked with the dye.

Work out an estimate for the total number of fish in the lake.
You must write down any assumptions you have made.

....
(Total 4 marks)

Q4.
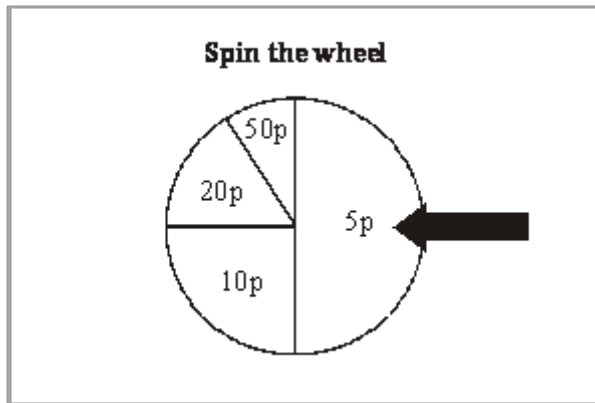
Bert has a game at a fair.

In the game players pay to spin a wheel.

When the wheel stops, the amount shown by the arrow is given to the player.
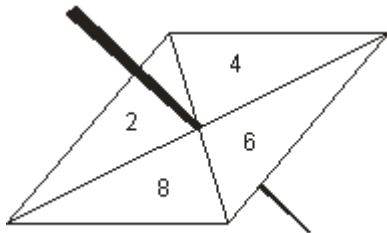The table shows the probabilities that the wheel will stop on 5p, on 10p, on 20p and on 50p.

	5p	10p	20p	50p
Probability	0.5	0.25	0.15	0.1

Bert wants to make a profit from the game.

Work out the minimum he can charge players to spin the wheel.

....
(Total 4 marks)

Q5.   Here are two fair 4-sided spinners.
One is a Blue spinner and one is a Red spinner.

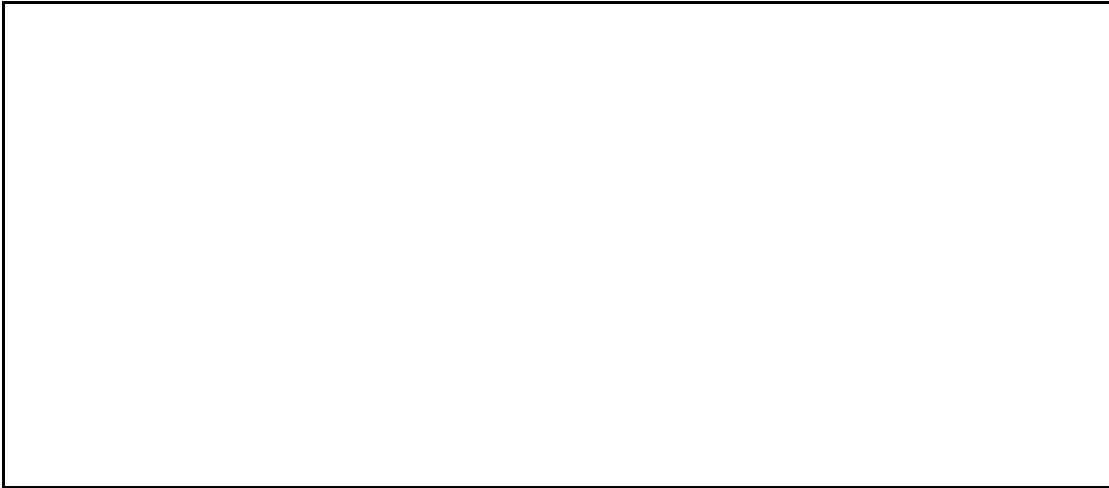**Blue Spinner**   **Red Spinner**
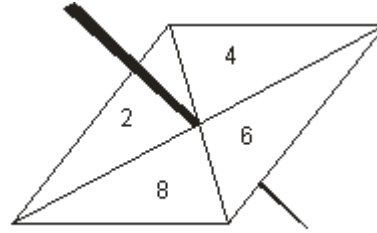
Blue spinner Red spinner

Each spinner has four sections numbered 2, 4, 6 and 8

Each spinner is to be spun once.

Total score = Blue spinner score + Red spinner score.

(a)   Find the probability that the total score will be 10.

....

(3)

Ali and Shazia play a game.

In each round of the game, Ali spins the Blue spinner once and Shazia spins the Red spinner once.

Ali wins when the Blue spinner score is greater than the Red spinner score.

Ali and Shazia play 80 rounds.

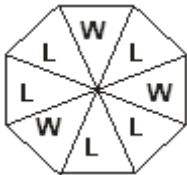(b)   Work out an estimate of the number of rounds that Ali will win.

....
(3)
(Total 6 marks)

Q6.   This spinner is used at a fairground.

When the spinner lands on a **W**, the customer wins a prize.

Diagram **NOT**
accurately drawn

The fairground owner expects 1000 customers to have a go.
Estimate the number of prizes the owner should buy.
Give reasons for your answer.

(Total 3 marks)

M1.

	Working	Answer	Mark	Additional Guidance
(a)		Correct method to choose a random sample	1	**B1** for equal chance of selection, e.g. number each laptop and then use the random number function on a calculator or pick the numbers out of a bag
(b)	$\frac{3}{80} \times 600 = 22.5$	22.5	2	**M1** for $\frac{3}{80} \times 600$ **A1** for 22.5 or 22 or 23 SC B1 for $\frac{22.5}{600}$ or $\frac{22}{600}$ or $\frac{23}{600}$
				Total for Question: 3 marks

M2.

Working	Answer	Mark	Additional Guidance
0.85 × 800	680	2	**M1** for 0.85 × 800 **A1** cao
			Total for Question: 2 marks

M3.

	Working	**Answer**	**Mark**	**Additional Guidance**

QWC (ii, iii)	$\dfrac{4}{50} = \dfrac{50}{N}$	625	4
	$(4 \times 12.5)/(50 \times 12.5)$ = 50/625		
		Assumption	
	$\dfrac{4}{50} = \dfrac{50}{N}$		
	$(4 \times 12.5)/(50 \times 12.5)$ = 50/625		

	Total for Question: 4 marks

M4.

Working	Answer	Mark	Additional Guidance
0.5×5 + 0.25×10 + 0.15×20 + 0.1×50 = 13	14p	4	**M2** for 0.5×5 + 0.25×10 + 0.15×20 + 0.1×50 oe or for a consistent calculation for *n* spins, e.g. 50×5 + 25×10 + 15×20 + 10×50 where *n* = 100 (condone one error) (M1 for 0.5 ×5 or 0.25×10 or 0.15×20 or 0.1×50 oe) **A1** for 13 or 14 **A1** for 14p
			Total for Question: 4 marks

M5.

	Working	Answer	Mark	Additional Guidance
(a)	4 6 8 10 6 8 10 12 8 10 12 14 10 12 14 16	$\frac{4}{16}$	3	**M1** Attempts to list all outcome pairs **A1** all 16 found **A1** cao **OR**

OR

$$\frac{1}{4} \times \frac{1}{4}$$

$$\frac{1}{4} \times \frac{1}{4} \times 4$$

OR

$$\frac{1}{4} \times \frac{1}{4}$$

(b) | | | 30 | 3

Total for Question: 6 marks

M6.

Working	Answer	Mark	Additional Guidance
Number of prizes should	(376) and justification that matches answer	3	**M1** estimate of probability

Total for Question: 3 marks

##

In their attempt to answer part (a) of this question many candidates depended on the word "random" thereby just rephrasing the wording of the question. Other candidates defined the term "random" rather than describe a method to explain how 80 laptops could be sampled from a population of 600. One quarter of candidates were awarded the mark available. These candidates usually referred to numbering the computers and picking 80 numbers from a hat containing the numbers 1 to 600 or to using a random number generator on a calculator to generate 80 numbers between 1 and 600. Some candidates suggested taking a stratified or systematic sample. Part (b) was well answered with over 60% of candidates gaining both marks for their response. A small but significant proportion of candidates worked out
600 ÷ 80 (= 7.5) then rounded their answer to 8 before multiplying by 3.

##

This was generally very well done. Most candidates were able to demonstrate a correct method. The main error was dividing by 0.85 instead of multiplying. Other errors were to divide 0.85 by 100 before multiplying (answer 6.8) and finding 1-0.85 or 15% eg 120. Another common error was leaving the answer as a fraction 680/800. A few rounded/estimated the probability first thus using 0.9 and then multiplied by 800. A few gave their final answer as an estimation i.e 700.