SAMPLE PAPER 6: PAPER 2

QUESTION 8 (30 MARKS)

Question 8 (a)

True population proportion = Sample proportion ± 1.96 (Standard error of the proportion) Standard error of the proportion = $\sqrt{\frac{p(1-p)}{n}}$ Confidence interval

= [sample parameter - 1.96(standard error), sample parameter + 1.96(standard error)]

For about 95% of all samples the confidence interval covers the population values of the parameter and for the other 5% it does not.

For a 99% confidence level, the confidence interval must be wider so that more samples cover the population parameter.

Confidence interval

= [sample parameter -2.576(standard error), sample parameter +2.576(standard error)]

Question 8 (b)

Sample proportion $p = \frac{200}{300} = \frac{2}{3}$ n = 300Population proportion $= \frac{2}{3} \pm 1.96 \sqrt{\frac{2}{3}(1-\frac{2}{3})}{300} = 0.613, 0.72$

Confidence interval = [0.613, 0.72]

For about 95% of all samples, the population proportion of all fifth years who believe the Junior Certificate should be scrapped is between 61.3% and 72%.

Question 8 (c)

Standard deviation of population $\sigma = 10$ cm	σ
Mean of the sample $\bar{x} = 173$ cm	$\mu = \overline{x} \pm 1.96 \times \frac{3}{\sqrt{\pi}}$
Number of the sample $n = 50$	\sqrt{n}
Population mean $\mu = ?$	10
	$\mu = 173 \pm 1.96 \times \frac{10}{\sqrt{50}} = 170.23, 175.77$
	$\sqrt{30}$

For about 95% of all samples, the population mean height of university students is between 170.23 cm and 175.77 cm.