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Statistics MCQs – Estimation Part 6

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101. Sand is packed into bags which are then weighed on scales. It is known that if full bags of sand are intended to weigh μ kg, then the weight recorded by the scales will be normally distributed with a mean μ kg and a standard deviation of 0.4kg. How many times would a full sack have to be weighed so that the estimate of the weight would be within 0.15 kg of the true weight with 95 % confidence?

- a. 23
- b. 43
- c. 13
- d. 28
- e. 18

Answer: D

102. Sand is packed into bags which are then weighed on scales. It is known that if full bags of sand are intended to weigh μ kg, then the weight recorded by the scales will be normally distributed with a mean μ kg and a standard deviation of 0.36kg. How many times would a full sack have to be weighed so that the estimate of the weight would be within 0.17 kg of the true weight with 95 % confidence?

- a. 23
- b. 43
- c. 13
- d. 28
- e. 18

Answer: E

103. A researcher wants to investigate the amount of lead per litre of waste water produced by her company. She plans to use statistical methods to estimate the

population mean of lead content per litre of water. Based on previous recordings she assumes that the lead content is normally distributed with a standard deviation of 20mg per litre. How large a sample should she take to estimate the mean lead content per litre of water to within 1mg with 95 % confidence?

- a. 1537
- b. 865
- c. 385
- d. 2401
- e. 97

Answer: A

104. A researcher wants to investigate the amount of lead per litre of waste water produced by her company. She plans to use statistical methods to estimate the population mean of lead content per litre of water. Based on previous recordings she assumes that the lead content is normally distributed with a standard deviation of 15mg per litre. How large a sample should she take to estimate the mean lead content per litre of water to within 1mg with 95 % confidence?

- a. 1537
- b. 865
- c. 385
- d. 2401
- e. 97

Answer: B

105. A researcher wants to investigate the amount of lead per litre of waste water produced by her company. She plans to use statistical methods to estimate the population mean of lead content per litre of water. Based on previous recordings she assumes that the lead content is normally distributed with a standard deviation of 20mg per litre. How large a sample should she take to estimate the mean lead content per litre of water to within 2mg with 95 % confidence?

- a. 1537
- b. 865
- c. 385
- d. 2401
- e. 97

Answer: C

106. A researcher wants to investigate the amount of lead per litre of waste water produced by her company. She plans to use statistical methods to estimate the population mean of lead content per litre of water. Based on previous recordings she assumes that the lead content is normally distributed with a standard deviation of 25mg per litre. How large a sample should she take to estimate the mean lead content per litre of water to within 1mg with 95 % confidence?

- a. 1537
- b. 865
- c. 385
- d. 2401
- e. 97

Answer: D

107. A researcher wants to investigate the amount of lead per litre of waste water produced by her company. She plans to use statistical methods to estimate the population mean of lead content per litre of water. Based on previous recordings she assumes that the lead content is normally distributed with a standard deviation of 20mg per litre. How large a sample should she take to estimate the mean lead content per litre of water to within 4mg with 95 % confidence?

- a. 1537
- b. 865
- c. 385
- d. 2401
- e. 97

Answer: E

108. The financial aid officer at a certain South African university wishes to estimate the mean cost of textbooks per semester for students. For the estimate to be useful it should be within R30 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R100.

- a. 43
- b. 35
- c. 97

d. 52

e. 25

Answer: A

109. The financial aid officer at a certain South African university wishes to estimate the mean cost of textbooks per semester for students. For the estimate to be useful it should be within R30 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R90.

a. 43

b. 35

c. 97

d. 52

e. 25

Answer: B

110. The financial aid officer at a certain South African university wishes to estimate the mean cost of textbooks per semester for students. For the estimate to be useful it should be within R20 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R100.

a. 43

b. 35

c. 97

d. 52

e. 25

Answer: C

111. The financial aid officer at a certain South African university wishes to estimate the mean cost of textbooks per semester for students. For the estimate to be useful it should be within R30 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R110.

a. 43

b. 35

c. 97

d. 52

e. 25

Answer: D

112. The financial aid officer at a certain South African university wishes to estimate the mean cost of textbooks per semester for students. For the estimate to be useful it should be within R40 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R100.

a. 43

b. 35

c. 97

d. 52

e. 25

Answer: E

113. If a random variable, X , follows a normal distribution with a variance of 25, what sample size should be selected if a 95 % confidence interval for the mean is to be calculated to within 2 units of the true population mean?

a. 25

b. 62

c. 11

d. 35

e. 97

Answer: A

114. If a random variable, X , follows a normal distribution with a variance of 64, what sample size should be selected if a 95 % confidence interval for the mean is to be calculated to within 2 units of the true population mean?

a. 25

b. 62

c. 11

d. 35

e. 97

Answer: B

115. If a random variable, X , follows a normal distribution with a variance of 25, what sample size should be selected if a 95 % confidence interval for the mean is to be calculated to within 3 units of the true population mean?

- a. 25
- b. 62
- c. 11
- d. 35
- e. 97

Answer: C

116. If a random variable, X , follows a normal distribution with a variance of 36, what sample size should be selected if a 95 % confidence interval for the mean is to be calculated to within 2 units of the true population mean?

- a. 25
- b. 62
- c. 11
- d. 35
- e. 97

Answer: D

117. If a random variable, X , follows a normal distribution with a variance of 25, what sample size should be selected if a 95 % confidence interval for the mean is to be calculated to within 1 unit of the true population mean?

- a. 25
- b. 62
- c. 11
- d. 35
- e. 97

Answer: E

118. A retail banker working at Nedbank wishes to estimate the mean monthly credit card expenditure of all Nedbank credit card holders. For the estimate to be useful it should be within R100 of the true population mean. How large a sample should be used

in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R150.

- a. 9
- b. 14
- c. 6
- d. 35
- e. 25

Answer: A

119. A retail banker working at Nedbank wishes to estimate the mean monthly credit card expenditure of all Nedbank credit card holders. For the estimate to be useful it should be within R80 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R150.

- a. 9
- b. 14
- c. 6
- d. 35
- e. 25

Answer: B

120. A retail banker working at Nedbank wishes to estimate the mean monthly credit card expenditure of all Nedbank credit card holders. For the estimate to be useful it should be within R100 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R120.

- a. 9
- b. 14
- c. 6
- d. 35
- e. 25

Answer: C

121. A retail banker working at Nedbank wishes to estimate the mean monthly credit card expenditure of all Nedbank credit card holders. For the estimate to be useful it

should be within R50 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R150.

- a. 9
- b. 14
- c. 6
- d. 35
- e. 25

Answer: D

122. A retail banker working at Nedbank wishes to estimate the mean monthly credit card expenditure of all Nedbank credit card holders. For the estimate to be useful it should be within R100 of the true population mean. How large a sample should be used in order to be 95 % confident of achieving this level of accuracy if we know the population standard deviation is R250.

- a. 9
- b. 14
- c. 6
- d. 35
- e. 25

Answer: E

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