QUIZ 9 V ESTIMATION

Roll No.	Marks

1. If $\bar{x}$ is the mean of a random sample (large) of size n from the population with known variance σ^2, then $(1-\alpha)$ 100% confidence interval for μ is

(a) $\left(\bar{x}+z_{\alpha/2}\frac{\sigma}{\sqrt{n}},\bar{x}-z_{\alpha/2}\frac{\sigma}{\sqrt{n}}\right)$ (b) $\left(\bar{x}-z_{\alpha/2}\frac{\sigma}{\sqrt{n}},\bar{x}+z_{\alpha/2}\frac{\sigma}{\sqrt{n}}\right)$

(c) $\left(\bar{x}+t_{\alpha/2}\frac{\sigma}{\sqrt{n}},\bar{x}-t_{\alpha/2}\frac{\sigma}{\sqrt{n}}\right)$ (d) $\left(\bar{x}-t_{\alpha/2}\frac{\sigma}{\sqrt{n}},\bar{x}+t_{\alpha/2}\frac{\sigma}{\sqrt{n}}\right)$ [ ]

2. If σ, E and α are known for a random sample (large) of size n, then

(a) $n=\left(\frac{E\sigma}{z_{\alpha/2}}\right)^2$ (b) $n=\left(\frac{ES}{t_{\alpha/2}}\right)^2$ (c) $n=\left(\frac{z_{\alpha/2}\sigma}{E}\right)^2$ (d) $n=\left(\frac{t_{\alpha/2}S}{E}\right)^2$ [ ]

3. If $\bar{x}$ and S are the mean and the standard deviations of a sample (small) of size n, then (1-α) 100% confidence interval for μ is

(a) $\left(\bar{x}+z_{\alpha/2}\frac{S}{\sqrt{n}},\bar{x}-z_{\alpha/2}\frac{S}{\sqrt{n}}\right)$ (b) $\left(\bar{x}-z_{\alpha/2}\frac{S}{\sqrt{n}},\bar{x}+z_{\alpha/2}\frac{S}{\sqrt{n}}\right)$

(c) $\left(\bar{x}+t_{\alpha/2}\frac{S}{\sqrt{n}},\bar{x}-t_{\alpha/2}\frac{S}{\sqrt{n}}\right)$ (d) $\left(\bar{x}-t_{\alpha/2}\frac{S}{\sqrt{n}},\bar{x}+t_{\alpha/2}\frac{S}{\sqrt{n}}\right)$ [ ]

4. If S, E and α are known for a random sample (small) of size n, then

(a) $n=\left(\frac{ES}{z_{\alpha/2}}\right)^2$ (b) $n=\left(\frac{ES}{t_{\alpha/2}}\right)^2$ (c) $n=\left(\frac{z_{\alpha/2}S}{E}\right)^2$ (d) $n=\left(\frac{t_{\alpha/2}S}{E}\right)^2$ [ ]

Let $\bar{x}$ be the mean of a random sample of size n with standard deviation σ. If μ_0 and σ_0 are the mean and the standard deviations of the prior distribution, then

5. the posterior mean = μ_1 =

(a) $\frac{n\bar{x}\sigma_0^2+\mu_0\sigma^2}{n\sigma_0^2+\sigma^2}$ (b) $\frac{n\bar{x}\sigma_0^2-\mu_0\sigma^2}{n\sigma_0^2+\sigma^2}$ (c) $\frac{n\bar{x}\sigma_0^2+\mu_0\sigma^2}{n\sigma_0^2-\sigma^2}$ (d) $\frac{n\bar{x}\sigma_0^2-\mu_0\sigma^2}{n\sigma_0^2-\sigma^2}$ [ ]

(6) the standard deviation of the posterior distribution = σ_1 =

(a) $\frac{\sigma_0^2\sigma^2}{n\sigma_0^2-\sigma^2}$ (b) $\frac{\sigma_0^2\sigma^2}{n\sigma_0^2+\sigma^2}$ (c) $\frac{n\sigma_0^2-\sigma^2}{\sigma_0^2\sigma^2}$ (d) $\frac{n\sigma_0^2+\sigma^2}{\sigma_0^2\sigma^2}$ [ ]

7 $(1-\alpha)$ 100% Bayesian interval for μ is

(a) $\left(\mu_1+z_{\alpha/2}\sigma_1,\mu_1-z_{\alpha/2}\sigma_1\right)$ (b) $\left(\mu_1+t_{\alpha/2}\sigma_1,\mu_1-t_{\alpha/2}\sigma_1\right)$

(c) $\left(\mu_1-z_{\alpha/2}\sigma_1,\mu_1+z_{\alpha/2}\sigma_1\right)$ (d) $\left(\mu_1-t_{\alpha/2}\sigma_1,\mu_1+t_{\alpha/2}\sigma_1\right)$ [ ]

8. If $\bar{x}$ is the mean of a random sample (large) of size n from the population with variance σ_2, then the maximum error E with $(1-\alpha)$ probability is

(a) $E = z_{\alpha/2}\frac{\sqrt{n}}{\sigma}$ (b) $E = t_{\alpha/2}\frac{\sqrt{n}}{\sigma}$ (c) $E = z_{\alpha/2}\frac{\sigma}{\sqrt{n}}$ (d) $E = t_{\alpha/2}\frac{\sigma}{\sqrt{n}}$ [ ]

9. If $\bar{x}$ and S are the mean and the standard deviations of a random sample (small) of size n, then the maximum error E with $(1-\alpha)$ probability is

(a) $E = z_{\alpha/2}\frac{\sqrt{n}}{S}$ (b) $E = t_{\alpha/2}\frac{\sqrt{n}}{S}$ (c) $E = z_{\alpha/2}\frac{S}{\sqrt{n}}$ (d) $E = t_{\alpha/2}\frac{S}{\sqrt{n}}$ [ ]

10. If the he confidence limit = 90%, then $z_{\alpha/2}$ =

(a) 1.645 (b) 0.8289 (c) 0.8159 (d) None [ ]

11. If the he confidence limit = 95%, then $z_{\alpha/2}$ =

(a) 0.8352 (b) 1.96 (c) 0.5199 (d) None [ ]

12. If the he confidence limit = 99%, then $z_{\alpha/2}$ =

(a) 0.8401 (b) 2.325 (c) 2.575 (d) None [ ]

13. If the he confidence limit = 95% and n = 16, then $t_{\alpha/2}$ =

(a) 1.753 (b) 2.131 (c) 2.120 (d) None [ ]

14. If the he confidence limit = 99% and n = 10, then $t_{\alpha/2}$ =

(a) 3.25 (b) 3.169 (c) 2.81 (d) None [ ]

15. A sample of size 100 is taken whose standard deviation is 5. What is the maximum error with 0.95 probability ?

(a) 3.92 (b) 0.098 (c) 0.98 (d) 392 [ ]

16. A sample of size 64 is taken whose standard deviation is 3. What is the maximum error with 0.95 probability ?

(a) 5.2266 (b) 0.735 (c) 0.918 (d) 41.813 [ ]

17. A sample of size 200 is taken whose standard deviation is 4. What is the maximum error with 0.95 probability ?

(a) 0.5543 (b) 0.0392 (c) 6.9296 (d) None [ ]

18. A sample of size 81 is taken whose variance is 9. What is the maximum error with 0.95 probability ?

(a) 1.96 (b) 0.2177 (c) 0.6533 (d) None [ ]

19. A sample of size 36 is taken whose variance is 16. What is the maximum error with 0.95 probability ?

(a) 1.3067 (b) 5.2267 (c) 0.2178 (d) None [ ]

20. A sample of size 144 is taken whose standard variance is 81. What is the maximum error with 0.95 probability ?

(a) 13.23 (b) 1.47 (c) 0.1225 (d) None [ ]