Formulae Sheet

Roll no-----------------------------------

1. $\overline{x} = \frac{\sum_{i=1}^{n} x_i}{n}$

2. $Z_{cal} = \frac{\overline{x}-\mu}{\sigma/\sqrt{n}}$

3. $Z_{cal} = \frac{\overline{x} - \mu}{S/\sqrt{n}}$

4. $S = \sqrt{\frac{\sum(x - \overline{x})^2}{n}}$

5. $S = \sqrt{\frac{1}{n}\{\sum_{i=1}^{n} x^2 - \frac{(\sum_{i=1}^{n} x)^2}{n}\}}$

6. $t_{cal} = \frac{\overline{x}-\mu}{s/\sqrt{n}}$

7. $s = \sqrt{\frac{\sum(x - \overline{x})^2}{n-1}}$

8. $s = \sqrt{\frac{1}{n(n-1)}\{n\sum_{i=1}^{n} x^2{}_i - (\sum_{i=1}^{n} x_i)^2\}}$

9. $\overline{x} - z_{\alpha/2}\frac{\sigma}{\sqrt{n}} < \mu < \overline{x} + z_{\alpha/2}\frac{\sigma}{\sqrt{n}}$

10. $\overline{x} - t_{(\alpha/2,n-1)}\frac{s}{\sqrt{n}} < \mu < \overline{x} + t_{(\alpha/2,\, n-1)}\frac{s}{\sqrt{n}}$

11. $\hat{p} - z_{\alpha/2}\sqrt{\frac{\hat{p}\hat{q}}{n}} < p < \hat{p} + z_{\alpha/2}\sqrt{\frac{\hat{p}\hat{q}}{n}}$

12. $\overline{d} - t_{(\alpha/2,n-1)}\frac{s_d}{\sqrt{n}} < \mu_d < \overline{d} + t_{(\alpha/2,\, n-1)}\frac{s_d}{\sqrt{n}}$

13. $s_d = \sqrt{\frac{\sum(d-\overline{d})^2}{n-1}}$

26. $Z_{cal} = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$

27. $Z_{cal} = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{n1} + \frac{S_2^2}{n2}}}$

28. $t_{cal} = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{s_p\sqrt{1/n_1 + 1/n_2}}$

29. $s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$

30. $t_{cal} = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$

31. $v = \frac{(s_1^2/n_1 + s_2^2/n_2)^2}{[(s_1^2/n_1)^2/(n_1 - 1) + (s_2^2/n_2)^2/(n_2 - 1)]}$

32. $\hat{p} = \frac{x}{n}$

33. $Z_{cal} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$

34. $Z_{cal} = \frac{(\hat{p}_1 - \hat{p}_2) - (p_1 - p_2)}{\sqrt{P_c q_c\left(\frac{1}{n1} + \frac{1}{n2}\right)}}$

35. $p_c = \frac{x_1 + x_2}{n_1 + n_2}$ and $q_c = 1 - p_c$

36. $P(\mu - k\sigma < X < \mu + k\sigma) \geq 1 - \frac{1}{k^2}$

Or

$P(|x - \mu| \leq k\sigma) \geq 1 - \frac{1}{k^2}$

Or

$P(|x - \mu| > k\sigma) \leq \frac{1}{k^2}$

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14. $sd = \sqrt{\frac{1}{n(n-1)}\{n\sum_{i=1}^{n} d^2{}_i \quad - (\sum_{i=1}^{n} d_i)^2\}}$

15. $d_i = x_{1i} - x_{2i}$ OR $d_i = x_{2i} - x_{1i}$

16. $\bar{d} = \frac{\sum_{i=1}^{n} d_i}{n}$

17. $n = \left(\frac{\sigma z_{\alpha/2}}{e}\right)^2$

18. $n = \frac{\hat{p}\hat{q}\, z^2{}_{\alpha/2}}{e^2}$

19. $n = \frac{0.25\, z^2{}_{\alpha/2}}{e^2}$

20. $n = \frac{z^2{}_{\alpha/2}}{4e^2}$

21. $C.I = (\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2}\sqrt{\frac{\sigma_1{}^2}{n_1} + \frac{\sigma_2{}^2}{n_2}}$

22. $C.I = (\bar{x}_1 - \bar{x}_2) \pm z_{\alpha/2}\sqrt{\frac{S_1{}^2}{n1} + \frac{S_2{}^2}{n2}}$

23. $C.I = (\bar{x}_1 - \bar{x}_2) \pm t_{(\alpha/2, n_1 + n_2 - 2)} S_p \sqrt{\frac{1}{n1} + \frac{1}{n2}}$

24. $C.I = (\bar{x}_1 - \bar{x}_2) \pm t_{(\alpha/2,\, v)}\sqrt{\frac{s_1{}^2}{n1} + \frac{s_2{}^2}{n2}}$

25. $C.I = (\hat{p}_1 - \hat{p}_2) \pm z_{\alpha/2}\sqrt{\frac{\hat{p}_1\hat{q}_1}{n_1} + \frac{\hat{p}_2\hat{q}_2}{n_2}}$

37. $g(x; p) = p\, q^{x-1}$, $x = 1, 2, 3, \cdots$

38. $b^*(x; k, p) = {}_{x-1}C_{k-1}\; p^k\, q^{x-k}$, $x = k, k+1, k+2, \ldots$

39. $P(B) = \sum_{i=1}^{n} (A_i \cap B) = \sum_{i=1}^{n} P(A_i)P(B|A_i)$

40. $P(A_i|B) = \frac{P(A_i)P(B|A_i)}{\sum_{i=1}^{n} P(A_i)P(B|A_i)}$