Conditions - Formulas

Select the number(s) of the conditions required for a valid Hypothesis Test (or Confidence Interval) Format example: Question # -Conditions 2,9,7

1. The population variances must be equal.
2. The population of differences must be (approximately) normally distributed.
3. Two random samples must be taken, one form each of the two populations of interest.
4. A random sample of differences must be selected from the population of all possible differences.
5. The two samples must be independent.
6. Both samples must be large ($n_1 \geq 30$ and $n_2 \geq 30$).
7. Both of the populations must be (approximately) normally distributed.
8. The sample must be large ($n \geq 30$).
9. The sample must be large enough so that both inequalities hold:
   $\pi - 3\sqrt{\frac{\pi(1-\pi)}{n}} > 0 \quad and \quad \pi + 3\sqrt{\frac{\pi(1-\pi)}{n}} < 1$
10. The population must be approximately normally distributed.
11. A random sample must be taken from the population.

Important formulas and expressions

$$s^2 = \frac{n\sum x^2 - (\sum x)^2}{n(n-1)} \qquad \frac{z^2 p(1-p)}{B^2} \qquad \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2} \qquad \frac{n_1 p_1 + n_2 p_2}{n_1+n_2}$$

$$\sigma^2 = \sum [X^2 P(X)] - \mu_x^2 \qquad \frac{z^2 s^2}{B^2} \qquad \frac{\overline{x}_D - D_0}{\frac{s_D}{\sqrt{n_D}}} \qquad \frac{z^2(s_1^2+s_2^2)}{B^2} \qquad z\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}$$

$$\frac{(\overline{x}_1 - \overline{x}_2) - D_o}{\sqrt{\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}}} \qquad \frac{(p_1-p_2)-0}{\sqrt{\frac{p(1-p)}{n_1}+\frac{p(1-p)}{n_2}}} \qquad \frac{s_1^2}{s_2^2} \qquad \frac{z^2[p_1(1-p_1)+p_2(1-p_2)]}{B^2}$$

$$C_{(n,x)} p^x (1-p)^{n-x}$$

$$\frac{(\overline{x}_1 - \overline{x}_2) - D_0}{\sqrt{\frac{s_p^2}{n_1}+\frac{s_p^2}{n_2}}} \qquad \left[\frac{s_1^2}{s_2^2}\frac{1}{F_1}, \frac{s_1^2}{s_2^2}F_2\right] \qquad t\sqrt{\frac{s_p^2}{n_1}+\frac{s_p^2}{n_2}} \qquad \frac{x-\mu_0}{\frac{s}{\sqrt{n}}} \qquad \frac{p-\pi_0}{\sqrt{\frac{\pi_0(1-\pi_0)}{n}}}$$

$$b_1 = \frac{S_{xy}}{S_x} \qquad b_0 = Y - b_1 X$$

$$\frac{(p_1-p_2)-D_0}{\sqrt{\frac{p_1(1-p_1)}{n_1}+\frac{p_2(1-p_2)}{n_2}}} \qquad \left[\frac{(n-1)s^2}{?}, \frac{(n-1)}{?}\right]$$

$$S_{xy} = n\sum(XY) - (\sum X)(\sum Y)$$

$$S_x = n\sum X^2 - (\sum X)^2$$