**Baluchistan Board of Intermediate and Secondary Education, Quetta**

Model paper for HSSC Examination 2017 and onwardsSubject: Statistics Total Marks = 85 Class: XII ============================================================

**Section-I (17×1 = 17 marks)**

**Q.1. Choose the correct option:-**

1. The parameters of binomial distribution are: (n and p, p and q, np and nq, np and npq)
2. The maximum ordinate of a normal curve is at: (x = µ, x = µ + σ, x = σ2, x = µ - 2σ)
3. Sample is a sub set of: (population, data, set, distribution)
4. Probability distribution of a statistic is called: ( sampling, data, parameter, sampling distribution)
5. The mean of sampling distribution of means is equal to: ($\overbar{x}$, µ, P, σ)
6. When sampling is done without replacement,  is equal to: (, , , )
7. If σ is known, confidence interval for µ is based on: (t-distribution, normal-distribution, χ2-distribution, binomial distribution)
8. Any hypothesis which is tested for purpose of rejection under the assumption that it is true is called: (null hypothesis, alternative hypothesis, statistical hypothesis, composite hypothesis)
9. 1 – α is the probability associated with: (type-I error, type-II error, level of confidence, level of significance)
10. In two sided test, an example of alternative hypothesis is: (H1: µ < 0, H1: µ > 0, H1: µ ≥ 0, H1: µ ≠ 0)
11. The dependent variable is also called: (regressor, regressand, continuous variable, independent)
12. A perfect positive correlation is signified by: (0. -1, +1, -1 to +1)
13. In regression equation $\hat{X}$ = a + bY, the $\hat{X}$ is called: (independent variable, dependent variable, qualitative variable, none of them)
14. Chi-square test should not be used if any expected frequency is: (less than 5, less than 10, more than 5, equal to 5)
15. If (AB) = (A)(B)/n, the two attributes A and B are: (independent, dependent, associated, qualitative)
16. The graph of time series is called: (histogram, historigram, straight line, ogive)
17. Wheat crops badly damaged on account of rains, is: (cyclical movement, irregular movement, secular trend, seasonal movement)

**Section-II (14×3 = 42 marks)**

**Q.2. Attempt any fourteen parts:-**

**(i)** Define binomial experiment. (ii) If X is normally distributed with a mean of 4 and standard deviation 4. Find the probability that X is more than 6. (iii) Define sampling distribution. (iv) Given N = 300, n = 100 and σ2 = 200. If sampling is done without replacement, find the value of . (V) What is probability sampling? (vi) Explain the terms estimate and estimator. (vii) Given n = 64, $\overbar{X}$ = 42.7, σ = 8 and  = 1.645. Find the confidence interval estimate for µ. (viii) What is meant by test statistic? (ix) Given σ = 80, n = 625, µ0 = 350 and $\overbar{X}$ = 356. Find Z.. (x) What is meant by statistical hypothesis? (xi) Given ∑(X - $\overbar{X}$)(Y - $\overbar{Y}$)= 0, ∑(X - $\overbar{X}$)2 = 10, ∑(Y - $\overbar{Y}$)2 = 10 and n = 5. Find coefficient of correlation. (xii) Explain the term regression. (xiii) Write a short note on scatter diagram. (xiv) What do you mean by association? (xv) Given (αBC) = 15, (αBγ) = 60, (αβC) = 40, (αβγ) = 70. Find (α). (xvi) Explain the method of semi-averages. Given ∑X = 0, ∑Y = 245. ∑X2 = 28, ∑XY = 66 and n = 7. Fit a linear trend.

**Q.3.** Draw all possible samples of size 2 without replacement from a population consisting of 3, 6, 9, 12. Form sampling distribution of sample means and verify that: (i) E ($\overbar{X}$ ) = µ (ii) Var ($\overbar{X}$) = 

**Q.4.** A random sample of 64 drinks from a soft drink machine has an average contents of 21.9 deciliters, with a standard deviation of 1.42 deciliters. Test the hypothesis that µ = 22.4 deciliters against the alternative hypothesis µ < 22.4 deciliters at the 5% level of significance.

**Q.5.** The following sample observations were randomly selected

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| --- | --- | --- | --- | --- | --- |
| X | 5 | 10 | 15 | 20 | 25 |
| Y | 25 | 20 | 15 | 10 | 5 |

Determine the value of $\hat{Y}$ when X is 30.

**Q.6.** Find chi-square for the following table to examine the association between subjects and their results. Use α = 0.05.

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|  ResultsSubjects  | Passed | Failed |
| Mathematics | 60 | 70 |
| Statistics | 210 | 190 |
| English | 360 | 410 |

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