

INTERMEDIATE PART-II (12th CLASS)

STATISTICS PAPER-II

TIME ALLOWED: 3.10 Hours

SUBJECTIVE

MAXIMUM MARKS: 83

NOTE: - Write same question number and its part number in answer book,
as given in the question paper.

SECTION-I

2. **Attempt any eight parts.** 8 × 2 = 16
- (i) Write the p.d.f of a Normal Distribution and define each term of it.
 - (ii) Discuss the importance of Normal Distribution.
 - (iii) In a Normal Distribution $\sigma^2 = 25$. Find Mean Deviation.
 - (iv) A Normal Distribution has a mean $\mu = 85$ and Standard Deviation $\sigma = 4.5$. Find value of Q_1 .
 - (v) In a normal distribution $\mu_4 = 708$ find μ_2 .
 - (vi) If $n = 200$, $X =$ No. of defective = 25 find 95% confidence Interval for the proportion of defective.
 - (vii) What is the difference between Point Estimation and Interval Estimation?
 - (viii) Define Level of Confidence.
 - (ix) Define the term Test Statistic.
 - (x) Define the Level of Significance.
 - (xi) What is the difference between RAM and ROM?
 - (xii) Define the Central Processing Unit.
3. **Attempt any eight parts.** 8 × 2 = 16
- (i) What is Population?
 - (ii) Define Statistic.
 - (iii) Define the non-sampling error.
 - (iv) Describe the Sampling with replacement.
 - (v) Define term Sampling Frame.
 - (vi) If $\delta = 4$, $N = 6$ and $n = 2$ then find $\delta_{\bar{x}}$ for sampling without replacement.
 - (vii) Define the term Regressand.
 - (viii) Write two properties of the least Squares Regression Line.
 - (ix) If $\bar{X} = 50$, $\bar{Y} = 110$ and $a = 10$. Find the values of b .
 - (x) Define the coefficient of Correlation.
 - (xi) Write two formula's of the coefficient of Correlation.
 - (xii) If $b_{yx} = -1.6$ and $b_{xy} = -0.4$ Find the value of r_{xy} .
4. **Attempt any six parts.** 6 × 2 = 12
- (i) Interpret the meaning of $Q = -1$.
 - (ii) Define the term Rank Correlation.
 - (iii) Write formula for Coefficient of Association.
 - (iv) Define analysis of Time Series.
 - (v) Define Signal.
 - (vi) Explain Seasonal Trend.
 - (vii) Give two examples of Secular Trend.
 - (viii) Write name of short term Variation of Time Series.
 - (ix) Define Historigram.

SECTION-II

NOTE: - Attempt any three questions.

- 5.(a) In a Normal Distribution, Mean is 250 and Standard deviation is 100. Find
- (i) $P(150 \leq x \leq 270)$
 - (ii) $P(x \geq 180)$ 4
- (b) Scores on a National Education Achievement Test are Normally Distributed with $\mu = 500$ and $\delta = 100$. 4
- (i) What is the 95th percentile of this distribution?
 - (ii) What are lower and upper quartiles of this distribution?
- 6.(a) If the size of the simple random sample from an infinite population is 36 and the standard error of the mean is 2. What must be the size of the sample become if the standard error is to be reduced to 1.2? 4
- (b) A random sample of 36 cases is drawn from a negatively skewed probability distribution with a mean of 2 and a standard deviation of 3. Find the mean and standard error of the sampling distribution of \bar{X} 4

- 7.(a) Given that:- $n = 7$, $\Sigma x = 35.9$, $\Sigma x^2 = 186.19$.
Compute 90% confidence interval for μ . 4
- (b) Given that: $n = 10$, $\bar{x} = 27$, $\sigma = 1.2$. Test that $\mu \leq 26.3$ at $\alpha = 0.05$.
Assume that sample is taken from normal population. 4
- 8.(a) Find regression equation of Y on X from the following information:-
 $r_{xy} = 0.6$, $\bar{X} = 12$, $\bar{Y} = 20$
 $S_x = 1.5$, $S_y = 2$ 4
- (b) From the following information compute coefficient of correlation. 4

$$n = 25 \quad \Sigma D_x = 160 \quad \Sigma D_x^2 = 1622$$

$$\Sigma D_y = 661 \quad \Sigma D_y^2 = 24829$$

$$\Sigma D_x D_y = 5396 \quad \text{where}$$

$$D_x = X - 160$$

$$D_y = Y - 661$$

- 9.(a) Find the chi-square (χ^2) using $\alpha = .05$ to the following attributes:- 4

Attribute	A_1	B_1	C_1
α	30	45	75
β	75	30	45

- (b) Fit a second degree parabola for the following data:- 4

Year	1985	1990	1995	2000	2005
Values	13	16	18	10	8

SECTION-III (PRACTICAL)

10. NOTE: - Attempt any three parts. 3 × 5 = 15

- (a) A population consists of 2, 4, 6. Consider all possible samples of size two with replacement from this population. Find mean of sampling distribution of variances.
- (b) In a random sample of 500, forty are defectives. Compute 99% confidence interval for the proportion of defectives in the population.
- (c) Determine the regression line Y on X and find the value of \hat{Y} when X is 7.

X	4	5	3	6	12
Y	4	6	5	7	8

- (d) Can we say that education depends on sex? Use $\alpha = 0.05$.

Sex	Education		
	Middle	Secondary	College
Male	30	45	75
Female	75	30	45

- (e) Calculate three years moving average for the following time series:-

Years	1992	1993	1994	1995	1996
Values	402	410	425	420	418

OBJECTIVE

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank. No credit will be awarded in case BUBBLES are not filled. Do not solve question on this sheet of OBJECTIVE PAPER.

Q.No.1

- (1) In a Normal Distribution, the maximum ordinate is at:-
 (A) Mean (B) Variance (C) Standard deviation (D) Q_1
- (2) In a Normal Distribution, Mean, Median and Mode are:
 (A) Unequal (B) Equal (C) Bell shaped (D) None of these
- (3) In a Normal Distribution, Mean deviation is equal to:-
 (A) 0.7979 (B) 0.7979σ (C) 0.6745 (D) 0.67456σ
- (4) Sample is a sub-set of:
 (A) Population (B) Data (C) Set (D) Distribution
- (5) Any measure of the population is called:-
 (A) Finite (B) Parameter (C) Without replacement (D) Random
- (6) Probability distribution of a Statistic is called:-
 (A) Sampling (B) Parameter (C) Data (D) Sampling distribution
- (7) Estimation is of two types:- (A) One sided and two sided (B) Type-I and type-II error
 (C) Point estimation and interval estimation (D) Biased and unbiased
- (8) Null hypothesis is denoted by:-
 (A) H_0 (B) H_1 (C) α (D) β
- (9) A hypothesis may be classified as:-
 (A) Simple (B) Composite (C) Null (D) All of these
- (10) The regression equation always passes through:
 (A) (x, y) (B) (a, b) (C) (\bar{x}, \bar{y}) (D) (\bar{x}, y)
- (11) A perfect positive correlation is signified by:-
 (A) 0 (B) -1 (C) +1 (D) -1 to +1
- (12) If $r_{xy} = 0$ then x and y are:-
 (A) Independent (B) Dependent (C) Zero (D) Associated
- (13) A qualitative characteristic is called:-
 (A) Constant (B) Variable (C) Attribute (D) Association
- (14) The range of Chi-Square distribution is:-
 (A) 0 to ∞ (B) $-\infty$ to 0 (C) $-\infty$ to $+\infty$ (D) 0 to n
- (15) In the multiplicative model of time series:-
 (A) $Y = T + S + C + I$ (B) $Y = TSCI$ (C) $Y = a + bx$ (D) $Y = a + bx + cx^2$
- (16) In second degree parabola the numbers of normal equations is:-
 (A) Two (B) Three (C) Four (D) Five
- (17) One byte equals:-
 (A) 8 bits (B) 4 bits (C) 6 bits (D) 12 bits

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**BOARD OF INTERMEDIATE AND SECONDARY EDUCATION,
MULTAN**

OBJECTIVE KEY FOR INTER (PART I/II) Supply Examination, 2016.

Name of Subject STATISTICS Session 2016 (S)

Q. Nos.	Paper Code 8181	Paper Code 8183	Paper Code 8185	Paper Code 8187
1.	a	b	a	b
2.	b	b	d	d
3.	b	a	c	c
4.	a	a	c	a
5.	b	b	a	d
6.	d	b	c	c
7.	c	a	a	c
8.	a	b	b	a
9.	d	d	b	c
10.	c	c	a	a
11.	c	a	a	b
12.	a	d	b	b
13.	c	c	b	a
14.	a	c	a	a
15.	b	a	b	b
16.	b	c	d	b
17.	a	a	c	a
18.				
19.				
20.				

سرٹیفیکیٹ بابت تصحیح سوالیہ پرچہ مارکنگ Key

ہم نے مضمون آ پرچہ آ گروپ سکیم انٹرسلٹنہ امتحان 2016ء کا سوالیہ پرچہ انشائیہ کی (Subjective & Objective) کو بنظر عین چیک کر لیا ہے یہ پرچہ سلیبس کے تین مطابق Set کیا گیا ہے۔ اس سوالیہ پرچہ میں کوئی غلطی غلطی نہ ہے۔ ہم نے سوالیہ پرچہ کا اردو اور انگریزی Version بھی چیک کر لیا ہے یہ Version آپس میں مطابقت رکھتے ہیں اور سلیبس (Syllabus) کے مطابق بھی ہیں۔ نیز اس پرچہ کی Key کی بابت بھی تصدیق کی جاتی ہے کہ یہ بھی درست بنائی گئی ہے۔ اس میں بھی کسی قسم کی کوئی غلطی نہ ہے۔ مزید یہ کہ ہم نے Key بنانے سے متعلق دفتر کی جانب سے تیار کردہ ہدایات وصول کر کے ان کا بغور مطالعہ کر لیا ہے اور ان کی روشنی میں Key بنائی ہے۔

PREPARED & CHECKED BY

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ثانوی و اعلیٰ ثانوی تعلیمی بورڈ، ملتان

موضوع: STATISTICS پرچہ II گروپ: 02-11-2016

جزل ہدایات برائے مارکنگ Key نیو سکیم اولڈ سکیم (مارکنگ سکیم)

انٹرنیٹ ٹیسٹ ایکٹ سٹالانڈا ضمنی امتحان 2016ء

Subject five

Q.No.2

(iii) $M.D = 0.7979 \sigma = 3.9895$

(iv) $Q_1 = \mu - 0.6745\sigma = 85 - 0.6745(4.5) = 81.96$

v) $M_4 = 3M_2^2$
 $708 = 3M_2^2 \Rightarrow M_2^2 = 236 \Rightarrow M_2 = 15.36$

vi)
$$p \pm z_{\alpha/2} \sqrt{\frac{pq}{n}}$$

$$= 0.125 \pm 1.96 \sqrt{\frac{(0.125)(0.875)}{200}}$$

$$= (0.079, 0.171)$$

Q.No.3 vi)
$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} \cdot \sqrt{\frac{N-n}{N-1}} = \frac{4}{1.4142} \sqrt{\frac{4}{5}} = 2.5298$$

ix) $b = \frac{\bar{y} - a}{\bar{x}} = \frac{110 - 10}{50} = 2$

xii) $r_{xy} = \sqrt{b_{yx} \cdot b_{xy}} = -0.8$

Q.No.4 i) Perfect -ve association b/w attributes.

SECTION - II

Q.No.5 a) correct value of $z = 0.2$

i) correct area = 0.1 = $0.2 + 0.2$

ii) correct area = 0.1 = 0.4

general instructions

b) 2 marks for both parts.

2 + 2 = 04 marks.

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Q.No. 6

a) correct value of $n = 04$ marks.

b) mean = 02 marks.

S.E = 02 = 02 + 02 = 04

Q.No. 7(a)

correct formula = 01 marks.

correct calculation = 03 marks

Total = 04 = marks

b)

04 marks

Q.No. 8

a) correct value of $b = 02$ marks

" " " " $a = 02$ marks

Total = 04 marks

b)

Correct formula = 01 marks.

Correct answer of $r = 03$ marks.

Q.No. 9

a) correct ~~value~~ formula = 01 marks
of chi-square.

~~Correct~~ correct value of $\chi^2 = 04$ marks.

b)

correct values of $a, b, c = 03$ marks.

Correct normal eqns/formulae = 01 marks

Total = 04 marks

Q.No. 10

Five marks for each part
(attempt any three)

$05 \times 3 = 15$ marks

21

19