

BOARD OF INTERMEDIATE AND SECONDARY EDUCATION, MULTAN.
OBJECTIVE KEY FOR INTERMEDIATE 2nd ANNUAL EXAMINATION, 2024'

Name of Subject: Statistics Part - II

Group:

Q. Nos	Paper Code 4181	Correct Answer	Paper Code 4183	Correct Answer	Paper Code 4185	Correct Answer	Paper Code 4187	Correct Answer
1	B	0.6745	A	$Y=T+S+C+I$	B	Level of Significance	C	Biased sample variance
2	C	40	B	Three Constants	C	α	D	Census
3	A	μ	D	10	C	=0	A	Sample mean
4	D	Zero	B	0.6745	D	$(\bar{X}, \bar{Y})$	B	Level of Significance
5	C	Biased sample variance	C	40	C	-1 and +1	C	α
6	D	Census	A	μ	B	0	C	=0
7	A	Sample mean	D	Zero	A	0 to + ∞	D	$(\bar{X}, \bar{Y})$
8	B	Level of Significance	C	Biased Sample Variance	A	$Y=T+S+C+I$	C	-1 and +1
9	C	α	D	Census	B	Three Constants	B	0
10	C	=0	A	Sample mean	D	10	A	0 to + ∞
11	D	$(\bar{X}, \bar{Y})$	B	Level of Significance	B	0.6745	A	$Y=T+S+C+I$
12	C	-1 and +1	C	α	C	40	B	Three constants
13	B	0	C	=0	A	μ	D	10
14	A	0 to + ∞	D	$(\bar{X}, \bar{Y})$	D	Zero	B	0.6745
15	A	$Y=T+S+C+I$	C	-1 and +1	C	Biased sample variance	C	40
16	B	Three constants	B	0	D	Census	A	μ
17	D	10	A	0 to + ∞	A	Sample mean	D	Zero
18	/	/	/	/	/	/	/	/
19	/	/	/	/	/	/	/	/
20	/	/	/	/	/	/	/	/
Cross Check	A B C D		A B C D		A B C D		A B C D	
Total	3 4 6 4		3 4 6 4		3 4 6 4		3 4 6 4	

سرٹیفکیٹ بابت صحیح سوالیہ پرچہ / مارکنگ Key

ہم نے مضمون Statistics پرچہ Und گروپ انٹرمیڈیٹ دوسرا سالانہ امتحان 2024 کا سوالیہ پرچہ انشائیہ و معروضی (Subjective & Objective) کو بنظر عین چیک کر لیا ہے یہ پرچہ Syllabus کے عین مطابق Set کیا گیا ہے۔ اس سوالیہ پرچہ میں کسی قسم کی کوئی غلطی نہ ہے۔ ہم نے سوالیہ پرچہ کا اردو اور انگریزی Version بھی چیک کر لیا ہے۔ یہ Version آپس میں مطابقت رکھتے ہیں۔ نیز اس پرچہ کی معروضی (MCQs) Key کی بابت تصدیق کی جاتی ہے کہ 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۔ نیز سب ایگزامینرز کیلئے تفصیلی مارکنگ ہدایات / مارکنگ سکیم / Rubrics بھی تیار کر دی گئی ہیں۔

Prepared & Checked By:

Dated: 29-10-2024

S.#	Name	Designation	Institution	Mobile No	Signature
1	Muhammad Nazeem Ali	Associate Professor	Govt. Graduate College of Science Multan	03006347745	
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4					
5					

Re-Checked By ہم نے درج بالا سوالیہ پرچہ (انشائیہ + معروضی) معروضی "Key" اور ہدایات کے حوالہ سے مکمل طور پر چیک کر لیا ہے۔ کسی قسم کی کوئی غلطی نہ ہے۔

1	Muhammad Zia	A.P.	Govt. Graduate College Civil Lines Multan	03006373579	
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30-10-2024

Paper Code Number: 4181		2024 (2 nd -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
STATISTICS PAPER-II					
TIME ALLOWED: 20 Minutes		OBJECTIVE		MAXIMUM MARKS: 17	
Q.No.1	You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	In a standard normal distribution, Q_3 is equal to:	0.7979	0.6745	- 0.6745	- 0.7979
2	If $X \sim N(40, 25)$, then median is:	15	25	40	5
3	Normal distribution has maximum ordinate at $X =$:	μ	0	1	δ
4	If $E(\bar{X}) = \mu$ then bias is:	Positive	Negative	100%	Zero
5	$S^2 = \frac{\sum(X - \bar{X})^2}{n}$ is:	Unbiased sample variance	Population variance	Biased sample variance	Standard deviation
6	Study of population is called:	Parameter	Statistic	Error	Census
7	The point estimator of population mean (μ) is:	Sample mean	Sample variance	Sample standard deviation	Sample size
8	α denotes:	Critical value	Level of significance	Level of confidence	Interval estimate
9	P (Type – I error) is equal to:	$1 - \alpha$	$1 - \beta$	α	β
10	If $\hat{y} = a$ then b_{yx} :	< 0	> 0	$= 0$	One
11	The regression line always passes through the point:	$(a, \bar{y})$	$(b, \bar{y})$	(a, b)	$(\bar{X}, \bar{Y})$
12	Correlation co-efficient ' r ' always lies between:	-1 and 0	0 and 1	-1 and +1	1 and 2
13	For two independent attributes $Q =$:	+1	0	-1	-1 and +1
14	The limits of χ^2 distribution are:	0 to $+\infty$	-1 to 1	0 to +1	-1 to 0
15	The additive model of time series is:	$Y = T + S + C + I$	$Y = TSCI$	$Y = a + bX$	$Y = a + bX + cX^2$
16	A second degree parabola has:	One constant	Three constants	Two constants	No constant
17	A decimal number system has base:	2	8	16	10

Paper Code Number: 4183		2024 (2 nd -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
STATISTICS PAPER-II					
TIME ALLOWED: 20 Minutes		OBJECTIVE		MAXIMUM MARKS: 17	
Q.No.1	You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	The additive model of time series is:	$Y = T + S + C + I$	$Y = TSCI$	$Y = a + bX$	$Y = a + bX + cX^2$
2	A second degree parabola has:	One constant	Three constants	Two constants	No constant
3	A decimal number system has base:	2	8	16	10
4	In a standard normal distribution, Q_3 is equal to:	0.7979	0.6745	- 0.6745	- 0.7979
5	If $X \sim N(40, 25)$, then median is:	15	25	40	5
6	Normal distribution has maximum ordinate at $X =$:	μ	0	1	δ
7	If $E(\bar{X}) = \mu$ then bias is:	Positive	Negative	100%	Zero
8	$S^2 = \frac{\sum(X - \bar{X})^2}{n}$ is:	Unbiased sample variance	Population variance	Biased sample variance	Standard deviation
9	Study of population is called:	Parameter	Statistic	Error	Census
10	The point estimator of population mean (μ) is:	Sample mean	Sample variance	Sample standard deviation	Sample size
11	α denotes:	Critical value	Level of significance	Level of confidence	Interval estimate
12	P (Type – I error) is equal to:	$1 - \alpha$	$1 - \beta$	α	β
13	If $\hat{y} = a$ then b_{yx} :	< 0	> 0	$= 0$	One
14	The regression line always passes through the point:	$(a, \bar{y})$	$(b, \bar{y})$	(a, b)	$(\bar{X}, \bar{Y})$
15	Correlation co-efficient ' r ' always lies between:	-1 and 0	0 and 1	-1 and +1	1 and 2
16	For two independent attributes $Q =$:	+1	0	-1	-1 and +1
17	The limits of χ^2 distribution are:	0 to $+\infty$	-1 to 1	0 to +1	-1 to 0

Paper Code Number: 4185		2024 (2 nd -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
STATISTICS PAPER-II		OBJECTIVE		MAXIMUM MARKS: 17	
TIME ALLOWED: 20 Minutes					
Q.No.1 You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.					
S.#	QUESTIONS	A	B	C	D
		Critical value	Level of significance	Level of confidence	Interval estimate
1	α denotes:				
2	P (Type – I error) is equal to:	$1 - \alpha$	$1 - \beta$	α	β
3	If $\hat{y} = a$ then b_{yx} :	< 0	> 0	$= 0$	One
4	The regression line always passes through the point:	$(a, \bar{y})$	$(b, \bar{y})$	(a, b)	$(\bar{X}, \bar{Y})$
5	Correlation co-efficient ' r ' always lies between:	-1 and 0	0 and 1	-1 and +1	1 and 2
6	For two independent attributes $Q =$:	+1	0	-1	-1 and +1
7	The limits of χ^2 distribution are:	0 to $+\infty$	-1 to 1	0 to +1	-1 to 0
8	The additive model of time series is:	$Y = T + S + C + I$	$Y = TSCI$	$Y = a + bX$	$Y = a + bX + cX^2$
9	A second degree parabola has:	One constant	Three constants	Two constants	No constant
10	A decimal number system has base:	2	8	16	10
11	In a standard normal distribution, Q_3 is equal to:	0.7979	0.6745	-0.6745	-0.7979
12	If $X \sim N(40, 25)$, then median is:	15	25	40	5
13	Normal distribution has maximum ordinate at $X =$:	μ	0	1	δ
14	If $E(\bar{X}) = \mu$ then bias is:	Positive	Negative	100%	Zero
15	$S^2 = \frac{\sum(X - \bar{X})^2}{n}$ is:	Unbiased sample variance	Population variance	Biased sample variance	Standard deviation
16	Study of population is called:	Parameter	Statistic	Error	Census
17	The point estimator of population mean (μ) is:	Sample mean	Sample variance	Sample standard deviation	Sample size

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Paper Code Number: 4187		2024 (2 nd -A) INTERMEDIATE PART-II (12 th Class)		Roll No: _____	
STATISTICS PAPER-II					
TIME ALLOWED: 20 Minutes		OBJECTIVE		MAXIMUM MARKS: 17	
Q.No.1	You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that bubble in front of that question number, on bubble sheet. Use marker or pen to fill the bubbles. Cutting or filling two or more bubbles will result in zero mark in that question.				
S.#	QUESTIONS	A	B	C	D
1	$S^2 = \frac{\sum(X - \bar{X})^2}{n}$ is:	Unbiased sample variance	Population variance	Biased sample variance	Standard deviation
2	Study of population is called:	Parameter	Statistic	Error	Census
3	The point estimator of population mean (μ) is:	Sample mean	Sample variance	Sample standard deviation	Sample size
4	α denotes:	Critical value	Level of significance	Level of confidence	Interval estimate
5	P (Type – I error) is equal to:	$1 - \alpha$	$1 - \beta$	α	β
6	If $\hat{y} = a$ then b_{yx} :	< 0	> 0	$= 0$	One
7	The regression line always passes through the point:	$(a, \bar{y})$	$(b, \bar{y})$	(a, b)	$(\bar{X}, \bar{Y})$
8	Correlation co-efficient ' r ' always lies between:	-1 and 0	0 and 1	-1 and $+1$	1 and 2
9	For two independent attributes $Q =$:	$+1$	0	-1	-1 and $+1$
10	The limits of χ^2 distribution are:	0 to $+\infty$	-1 to 1	0 to $+1$	-1 to 0
11	The additive model of time series is:	$Y = T + S + C + I$	$Y = TSCI$	$Y = a + bX$	$Y = a + bX + cX^2$
12	A second degree parabola has:	One constant	Three constants	Two constants	No constant
13	A decimal number system has base:	2	8	16	10
14	In a standard normal distribution, Q_3 is equal to:	0.7979	0.6745	-0.6745	-0.7979
15	If $X \sim N(40, 25)$, then median is:	15	25	40	5
16	Normal distribution has maximum ordinate at $X =$:	μ	0	1	δ
17	If $E(\bar{X}) = \mu$ then bias is:	Positive	Negative	100%	Zero

INTERMEDIATE PART-II (12 th Class)				2024 (2 nd -A)	Roll No:														
STATISTICS PAPER-II																			
TIME ALLOWED: 2.40 Hours			SUBJECTIVE		MAXIMUM MARKS: 68														
NOTE: Write same question number and its parts number on answer book, as given in the question paper.																			
SECTION-I																			
2. Attempt any eight parts.				8 × 2 = 16															
(i)	What is the shape of normal curve?		(ii)	What is the role of μ in normal distribution?															
(iii)	Define normal cumulative distribution function.		(iv)	In an normal distribution $r = 9$ find Q.D.															
(v)	For a standard normal distribution find $P(Z < 1.645)$		(vi)	Define statistical inference.															
(vii)	What is confidence interval?		(viii)	What is level of confidence?															
(ix)	What is difference between left and right tailed test?		(x)	Define alternative hypothesis with example.															
(xi)	What is difference between softcopy and hardcopy?		(xii)	What are secondary storage devices?															
3. Attempt any eight parts.				8 × 2 = 16															
(i)	What are the two advantages of sampling?		(ii)	Define sampling distribution.															
(iii)	What is sample survey?		(iv)	Differentiate between a stratum and cluster.															
(v)	Given $N = 310$, $n = 100$, $\sigma_{\bar{x}} = 35$ if sampling is done with replacement, find standard deviation of population.																		
(vi)	Given		Find $\mu_{\bar{x}}$ mean of sampling distribution of mean for a random sample of size 36.																
	<table><tr><td>X</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>$P(X)$</td><td>0.2</td><td>0.4</td><td>0.3</td><td>0.1</td></tr></table>	X	4	5	6	7	$P(X)$	0.2	0.4	0.3	0.1								
X	4	5	6	7															
$P(X)$	0.2	0.4	0.3	0.1															
(vii)	Given $\bar{X} = 5$, $\bar{Y} = 4$, $\sum Y = 100$, $\sum XY = 484$ and $\sum Y^2 = 425$. Determine the regression coefficient of X on Y .																		
(viii)	What is meant by curve fitting?		(ix)	Define regressand.															
(x)	If $\hat{Y} = 30 - 2X$, $\hat{X} = 20 - 0.01Y$ find ' r '		(xi)	Define the term correlation coefficient.															
(xii)	What do you mean by correlation coefficient $r = 0$, $+1$																		
4. Attempt any six parts.				6 × 2 = 12															
(i)	Define Contingency table.		(ii)	Differentiate between attribute and variable.															
(iii)	If $n = 1024$, $(\alpha) = 880$, $(\beta) = 640$ find $(\alpha\beta)$		(iv)	Define analysis of time series.															
(v)	Name the components of time series.		(vi)	Define seasonal variation with example.															
(vii)	Give four examples of irregular variation.																		
(viii)	Explain the difference between histogram and historiogram.																		
(ix)	If $\hat{Y} = 10 - 2X$. Find the trend values for $X = 0, 1, 2, 3$																		
SECTION-II																			
NOTE: Attempt any three questions.				3 × 8 = 24															
5.(a)	If Z is a standard normal random variable with Mean 0 and Variance 1 then find:				4														
	(i) $P(Z < 1.46)$		(ii) $P(Z > 2.58)$																
(b)	Let $X \sim N(20, 25)$. Find the area under the normal curve. (i) below 30 (ii) above 30				4														
6.(a)	Take all possible samples of size 2 without replacement from the population 3, 5, 7, 9, 11. Find sample means and verify that (i) $\mu_{\bar{x}} = \mu$ (ii) $\sigma_{\bar{x}}^2 = \frac{\sigma^2}{n} \left(\frac{N-n}{N-1} \right)$				4														
(b)	A population consists of values 2, 4 and 5. Make sampling distribution of sample proportions of even numbers and verify that (i) $\mu_{\hat{p}} = P$ (ii) $\sigma_{\hat{p}}^2 = \frac{Pq}{n}$				4														
7.(a)	A sample of 16 values from a normal population showed a mean 42.0 and $\sum(x - \bar{x})^2 = 136$. Find 90% confidence interval for μ .				4														
(b)	In a random sample of 1000 houses in a city, 620 have own solar system for electricity consumption. Is this sufficient evidence to say that $\frac{2}{3}$ of the houses of the city have solar system for electricity? Use $\alpha = 0.01$.				4														
8.(a)	Given the following data:				4														
	<table><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Y</td><td>1.0</td><td>1.8</td><td>3.3</td><td>4.5</td><td>6.3</td></tr></table>	X	0	1	2	3	4	Y	1.0	1.8	3.3	4.5	6.3	Determine the least-squares regression line of y on X .					
X	0	1	2	3	4														
Y	1.0	1.8	3.3	4.5	6.3														
(b)	The following data were obtained: $n = 10$, $\bar{X} = 70$, $\bar{Y} = 155$, $\sum(X - \bar{X})^2 = 120$, $\sum Y^2 = 240550$, $\sum(X - \bar{X})(Y - \bar{Y}) = 150$ calculate correlation coefficient.				4														
9.(a)	Find the rank correlation coefficient between Noise (low, medium, high) and Anxiety (low, medium, high). Comment your answer.				4														
	<table><tr><td>Noise</td><td>low</td><td>medium</td><td>high</td><td>high</td><td>medium</td></tr><tr><td>Anxiety</td><td>low</td><td>high</td><td>medium</td><td>high</td><td>low</td></tr></table>	Noise	low	medium	high	high	medium	Anxiety	low	high	medium	high	low						
Noise	low	medium	high	high	medium														
Anxiety	low	high	medium	high	low														
(b)	Find 3-year moving averages using the time series data for the years 2016 – 2021. Comment your answer.				4														
	<table><tr><td>Year</td><td>2016</td><td>2017</td><td>2018</td><td>2019</td><td>2020</td><td>2021</td></tr><tr><td>Inflation</td><td>125</td><td>139</td><td>156</td><td>169</td><td>202</td><td>219</td></tr></table>	Year	2016	2017	2018	2019	2020	2021	Inflation	125	139	156	169	202	219				
Year	2016	2017	2018	2019	2020	2021													
Inflation	125	139	156	169	202	219													