



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – 2020

Paper: Statistics (Advanced)

Course Code: BBA-410 Part – I (Compulsory)

Time: 15 Min. Marks: 10

Roll No. in Fig.

Roll No. in Words.

Signature of Supdt.:

ATTEMPT THIS PAPER ON THIS QUESTION SHEET ONLY.

Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

Q.1. Encircle the correct option.

(10x1=10)

- I. **Coefficient of determination** communicates that;
 - a) How much is strength of linear relationship between the variables?
 - b) How much proportion of total variation in independent variable is due to variation in dependent variable?
 - c) How much proportion of total variation in dependent variable is due to variation in independent variable?
 - d) None of the above.
- II. What is true from the following for **regression coefficient y on x as to be negative**?
 - a) The correlation coefficient will be either positive or negative.
 - b) The regression coefficient y on x will be positive.
 - c) The coefficient of determination will also be negative.
 - d) Both coefficient of correlation and other regression coefficient will also be negative.
- III. **Level of Significance (α)** is the chances of committing:
 - a) Type-I Error.
 - b) Type-II Error.
 - c) Error either Type-I or Type-II.
 - d) Sampling Error.
- IV. The **Z-value 1.96** will be used for level of significance as to be:
 - a) 5%
 - b) 10%
 - c) 90%
 - d) 95%
- V. The **confidence limits** $(\bar{X} \pm Z_{\alpha} \times \frac{\sigma}{\sqrt{n}})$ used to estimate:
 - a) Sample mean.
 - b) Population mean.
 - c) Population mean for sample of large size only.
 - d) Population mean for sample of small size only.

- VI. **Test of Association of Attributes** carried out with the use of test statistic:
- a) Z
 - b) t
 - c) F
 - d) *Chi – square*
- VII. To test **Y is independent from X** through t-test, the null hypothesis you prefer to use is:
- a) $H_0: \alpha = 0$
 - b) $H_0: \alpha \neq 0$
 - c) $H_0: \beta = 0$
 - d) $H_0: \beta \neq 0$
- VIII. The **degree of freedom** for a contingency table of size 4×5 will be:
- a) 20
 - b) 12
 - c) 9
 - d) 0
- IX. **Error Sum of square** in ANOVA is the of total and between sum of squares:
- a) Product
 - b) Quotient
 - c) Sum
 - d) Difference
- X. If in linear regression model $Y = \alpha \pm \beta X$, $\beta = 0$ then the model suggest that
- a) Y is independent from X.
 - b) Y is free from X.
 - c) Both b & c.
 - d) None of the above.



ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q2: Write short answers of following: (02× 10 = 20)

- i. Errors relating to testing of hypothesis.
- ii. General testing procedure.
- iii. Acceptance and rejection regions.
- iv. Assumptions carried out in testing through t-statistics.
- v. Give two formulae to estimate population variance.
- vi. Contingency Table.
- vii. ANOVA Table
- viii. Find the value coefficient of determination from $b_{xy} = -0.35$ and $b_{yx} = -0.85$. Also interpret the result.
- ix. What is meant by degree of freedom?
- x. Define standard error of estimate of sample mean (\bar{x}).

Q3 (a): To estimate mean average time of producing an item and average variation in producing an item following data is collected from an ongoing producing plant.

Minutes: 15, 11, 19, 22, 25, 14, 16, 13, 21, and 14.

Calculate requisite quantities. (05)

(b): Assume that the time of producing an item is normally distributed for the data reported in part (a). Test the hypothesis that the mean production time in population is more than 15 minutes using 5% level of significance. (05)

Q4 (a): Fit least-square regression line to estimate future demand against given price from following data.. (05)

Price (Rs./unit)	5	10	15	20	25	30
Demand (units in thousands)	100	90	85	75	60	50

(b): Compute simple correlation coefficient and two regression coefficients from the data of Question-4(a). Also state findings you may draw from the result. (05)

Q5 (a): Calculate value of chi-square from the following table: (05)

Attributes	A	Not-A
B	120	80
Not-B	180	120

(b): Prepare ANOVA Table from the following data: (05)

A	B	C
2	13	20
4	15	22
5	12	25
8	20	28
11	20	30