

# Quaid-i-Azam University, Islamabad

## Business Statistics and Mathematics (BC-101)

### B.Com Part-I

### SECTION –A

Time Allowed: 40 minutes

Maximum Marks: 32

Q-1 Encircle the appropriate one.

(12x1=12 )

- (i) The word statistics may have been derived from latin word  
A) Status B) Statistik  
C) Statistic D) Statics .
- (ii) The most popular value of data is called  
A) Arithmetic mean B) Median  
C) Mode D) G.M
- (iii) Index numbers are called  
A)Economic barometer B) Statistical barometer  
C)Mathematical barometer D) Physical barometer
- (iv) The probability of an event is always lies between  
A) -1 and 0 B) 0 and 1  
C) -1 and +1 D) None of the above
- (v) In regression analysis , another name of independent variable is  
A) Regressand B) Predictand  
C) Regressor D) Explained variable
- (vi) Relationship between the attributes is called  
A) Regression B) Correlation  
C) Association D) Causation
- (vii)What is the  $a_{100}$  of the series 4,8,12,16,....  
A) 200 B) 300  
C) 400 D) 500
- (viii) The rate at which sum of money would be doubled itself in 20 years is  
A) 3% B) 5%  
C) 7% D) 9%
- (ix) For a symmetric matrix A , the transpose of a matrix  $A^t$  is equal to  
A) I B) A  
C) -A D) None of the above
- (x) If payments start on a certain date and continues for indefinite period then it is called  
A ) Ordinary annuity B) Annuity due  
C ) Perpetuity D) contingent annuity.
- (xi) In quadratic equation  $ax^2+bx+c=0$  , if  $b^2-4ac > 0$  the roots are  
A ) real and distinct B ) Imaginary and distinct  
C) real and equal D) Imaginary and different
- (xii) The graph of linear equation is  
A) parabola B) straight line  
C) ellipse D) None of the above

**Q-2    Write short answers of the following. Your answer should not exceed three to four lines.** (10x2=20)

(i)For a frequency distribution of a variable x it is given that  $X=10+5U$ ,  
 $\sum f =90$ ,  $\sum fu = -45$  .Find the value of A.M

(ii) If a distribution has Mean = 54, Mode =74, find median of the distribution

(iii) Write down uses of Index number in Business.

(iv) If     $n =15$ ,  $S_x=7.933$ ,  $S_y=16.627$ ,  $\sum(X -X)(Y -Y) =148$ .  
Find the regression coefficients and correlation coefficient.

(v) Calculate chi-square statistic from the following (2x2) contingency able.

	A1	A2
B1	20	30
B2	15	35

(vi) Differentiate the following function

$Y=2 X^{2/3}+7 X^{1/3} +5$

(vii) If A is singular find the value of x

A=  $\begin{bmatrix} x & 10 \\ 2 & 5 \end{bmatrix}$

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(viii) Find the compound interest and total amount on Rs.3100 and rate of interest is 4% compounded semi-annually for 5 years .

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(ix) A property dealer sells the property and gets commission of Rs.5500 at the rate of 5 ½ % . what is the amount of property ?

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(x) Ahmad saves Rs. 1on the first day, Rs.2 on second day, Rs.3 on third day, and so on. How much money he saved in 30 day ?

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## Business Statistics and Mathematics (BC-101)

B.Com Part-I

### SECTION-B

Time allowed : 2:20 Hrs

Max Marks : 68

**Note: Attempt any four questions. All questions carry equal marks.**

Q-3 (a) Find Arithmetic mean, Median, Mode and variance of the following . (09)

classes	30-39	40-49	50-59	60-69	70-79	80-89	90-99
frequency	2	3	11	15	25	10	4

(b) Calculate Laspeyre's, Paasche's, Fisher's and Marshall's index numbers for 2012 taking 2000 as base. (08)

commodity	2000		2012	
	Price	Quantity	Price	Quantity
A	10	5	12	6
B	15	8	18	10
C	20	10	22	10

Q-4 (a) Fit a least square line to the following pairs of values and estimate y when x= 10. (11)

X	1	2	3	4	5	6	7
Y	2	6	7	8	10	14	15

Also calculate correlation coefficient .

(b) Two fair dice are thrown, Find the Probability of getting: (06 )

- (i) A double six (ii) A doublet  
(iii) Sum of two dice will be even (iv) The sum is at least 8  
(v) Sum of numbers is less than 6 (vi) Sum of numbers is 7.

Q-5 (a) A population consists of 2, 4 , 6 ,8 ,10 ,12. Draw all possible samples of size 2 (09)

Without replacement from population.

- i) Make sampling distribution of mean .  
ii) Find mean and variance of sampling distribution of mean.

iii) Verify that (a)  $\mu_{\bar{x}} = \mu$

$$(b) \sigma_{\bar{x}}^2 = \frac{\sigma^2}{n} \left( \frac{N-n}{N-1} \right)$$

(b) A random sample of 200 married men were classified according to education and number of children as indicated below: (08)

Education of father	Number of children		
	0-1	2-3	Over 3
Elementary	13	37	35
Secondary	19	42	14
College	12	17	11

Test the hypothesis at 5% level of significance that family size is independent of education of father.

Q-6 Solve the equation by the help of matrices. (17 )

$$2x + 3y + z = 13$$

$$3x + 2y + 4z = 17$$

$$4x + 5y + 2z = 24$$

Q-7 (a) Solve the equation (08)

$$\sqrt{3x+4} + \sqrt{5-x} = 5$$

(b) A sum of Rs.30,000 is invested , a part at 5% simple interest and (09)

The remainder at 8% simple interest. And earned profit Rs.2100.

How much was invested at each rate.

Q-8 (a) Find the amount of ordinary annuity of Rs. 5000 deposited at (08)

the end of each quarter for 5 years at 8 % compounded quarterly.

(b) The difference between simple interest and compound interest for (09)

3 years at 5 % is Rs. 61 . Find the principal.

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