FOURTH SEMESTER B.Com. DEGREE (S.D.E.) EXAMINATION, JULY 2013

(U.G.—CCSS)

BC4 C04—QUANTITATIVE TECHNIQUES FOR BUSINESS

	Time	Weightage
Part I Descriptive Questions	2.45 Hours	27
Part II Multiple Choice Questions	0.15 Hour	3
Maximum	3 Hours	30 Weightage

Part I
Part A

I. Answer all *nine* questions in one *or* two sentences each. Each question carries a weightage of 1.

1. What is quantitative techniques ?

2. State any *two* limitations of quantitative techniques.

3. What is correlation ?

4. What are regression lines ?

5. What is the classical definition of probability ?

6. Define Poisson Distribution.

7. What are Type I and Type II errors ?

8. Define Chi-square test.

9. What do you mean by degrees of freedom in hypothesis testing ?

(9 × 1 = 9 weightage)

Part B

II. Answer any *five* questions. Answer not to exceed one *page* each. Each question carries a weightage of 2 :

10. State the addition rule for (a) Mutually exclusive events ; and (b) Non-mutually exclusive events. Give *one* example of each.

11. Explain briefly the different types of correlation and regression.

12. A bag contains 8 balls, identical except for colour of which 5 are red and 3 white. A man draws two balls at random one after another without replacement. What is the probability that one of the balls drawn is white and other red ? What would be the value of these probabilities of the ball drawn is replaced before the other ball is drawn.

Turn over

13. Number of road accidents on a highway during a month follows a Poisson distribution with mean 4. Find the probability that in a certain months, the number of accidents will be (a) Not more than two : (b) Exactly three. Given $e^{-4} = 0.01832$.

14. The weight of college students of a University is distributed normally with mean 54 kgs and standard deviation of 12 kgs. What percentage of students have weight between :

   (1) 48 and 56 kg.

   (2) More than 56 kg.

15. Eight Coins were tossed for 256 times and the following results were obtained :—

No. of heads	0	1	2	3	4	5	6	7	8
Frequency	2	6	30	52	67	56	32	10	1

Are the coins biased ? Use χ^2 test. [Given Expected frequencies : 1, 8, 28, 56, 70, 56, 28, 8, 1].

16. The average life of 26 Electric tubes were found to be 1,300 hours with a standard deviation of 150 hours. Test whether these tubes are considered to be a random sample from a normal population with mean 1,400 hours.

(5 × 2 = 10 weightage)

Part C

III. Answer any *two* questions. Each question carries a weightage of 4 :

17. Explain the nature, scope and extent of application of quantitative techniques in Economics and Commerce.

18. In a correlation study the following values were obtained :

	X	Y
Mean	... 65	67
Standard deviation	... 2.5	3.5
Coefficient of Correlation	...	0.8

Find the two regression equations that are associated with the above values. Also ascertain value of X when Y = 60 and value of Y when X = 70.

19. If $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{3}$ and $P(A \cup B) = \frac{1}{2}$. Calculate :

   (a) $P(A \cap B)$.

   (b) $P(A \cap \bar{B})$.

   (c) $P(\bar{A} \cap \bar{B})$.

(2 × 4 = 8 weightage)

Part II

Multiple Choice Questions :

1. If plotted points in a dot chart lie on a straight line parallel to X-axis, it shows ————— of correlation.

   (a) High degree.

   (b) Low degree.

   (c) Absence.

   (d) None of these.

2 If plotted points in a scatter diagram lie on a straight line vertical to the Y-axis, then $r =$ —————.

   (a) + 1.
           (b) 0.

   (c) –1.
           (d) None of these.

3 Product moment correlation was developed by —————.

   (a) Karl Pearson.
           (b) Charles Edward Spearman.

   (c) Kelly.
           (d) None of these.

4 If m is the correlation coefficient, then the quantity $(1 - m^2)$ is called —————.

   (a) Coefficient of determination.

   (b) Coefficient of non-determination.

   (c) Coefficient of alienation.

   (d) None of these.

5 ————— refers to analysis of average relationship between two variables to provide a mechanism for prediction.

   (a) Correlation.
           (b) Regression.

   (c) Average.
           (d) None of these.

6 When probability is revised on the basis of all the available information, it is called —————.

   (a) Priori probability.
           (b) Posterior probability.

   (c) Continuous.
           (d) None of these.

7 Probability distribution is also called theoretical distribution.

   (a) Yes.
           (b) No.

   (c) Probability.
           (d) None of these.

8 Random variable is also called —————.

   (a) Stochastic variable.
           (b) Chance variable.

   (c) Both.
           (d) None.

9 If the random variable of a probability distribution assumes any value in a given interval, then it is called —————.

   (a) Discrete probability distribution.

   (b) Continuous probability distribution.

   (c) Probability distribution.

   (d) None of these.

10 npq is the variance of —————.

   (a) Binomial distribution.
           (b) Poisson distribution.

   (c) Normal distribution.
           (d) None of these.

Turn ove

11 The height of normal curve is at its maximum at the —————.

    (a) Mode.

                        (b) Median.

    (c) Mean.

                        (d) None of these.

12 Normal distribution is —————.

    (a) Continuous.

                        (b) Unimodal.

    (c) Symmetrical.

                        (d) All of these.

13 An approximate relation between MD about mean and SD of a normal distribution is —————.

    (a) 5MD = 4 SD.

                        (b) 3 MD = 3 SD.

    (c) 3MD = 2 SD.

                        (d) 4MD = 5 SD.

14 Coefficient of skewness of a normal distribution is —————.

    (a) 0.

                        (b) Less than 0.

    (c) More than 0.

                        (d) In between +1 and −1.

15 Quartile Deviation (Q.D.) for normal distribution is equal to —————.

    (a) 5/4 S.D.

                        (b) 3/2 S.D.

    (c) 4/5 S.D.

                        (d) 2/3 S.D.

16 An alternative hypothesis is denoted by —————.

    (a) H_0.

                        ✓(b) H_1.

    (c) H_2.

                        (d) None of these.

17 Who developed F-test ?

    (a) R.A. Fischer.

                        (b) Karl Pearson.

    (c) William Gosset.

                        (d) James Bernoulli.

18 The probability level of rejecting a true null hypothesis is called —————.

    (a) Degree of freedom.

                        ✓(b) Level of significance.

    (c) Level of acceptance.

                        (d) None of these.

19 ————— tests follow assumptions about population parameters.

    ✓(a) Parametric.

                        (b) Non-parametric.

    (c) Level of acceptance.

                        (d) None of these.

20 ————— are distribution free tests.

    (a) Parametric tests.

                        ✓(b) Non-parametric tests.

    (c) Level of acceptance.

                        (d) None of these.

(3 weightag