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Name.....

Reg. No.....

THIRD SEMESTER B.Com./B.B.A. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

B.B.A.

BBA IIIC 03—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours

Maximum : 80 Marks

**Part I**

*Answer all the questions.*

*Each question carries 1 mark.*

Choose the correct answer from the choices given :

1. Queuing theory is also known as :
  - (a) Decision theory.
  - (b) Waiting line theory.
  - (c) Game theory.
  - (d) None of these.
2. The range of variation of probability lies between :
  - (a)  $-\infty < p < +\infty$ .
  - (b)  $-\infty < p < 0$ .
  - (c)  $0 < p < +\infty$ .
  - (d)  $0 < p < 1$ .
3. The lines of regression intersect at the point :
  - (a) (X, Y).
  - (b) Mean of (X, Y).
  - (c) (0, 0).
  - (d) (1, 1).
4. A family of parametric distribution in which mean is equal to variance is :
  - (a) Binomial distribution.
  - (b) Poisson distribution.
  - (c) Gamma distribution.
  - (d) Normal distribution.
5. The outcomes of an experiment classified as success A and failure  $A^c$  will follow a Bernoulli distribution if :
  - (a)  $P(A) = 1/2$ .
  - (b)  $P(A) = 0$ .
  - (c)  $P(A) = 1$ .
  - (d)  $P(A)$  remains constant in all trials.

**Turn over**

Fill in the blanks :

6. The square of the standard normal variate is called \_\_\_\_\_ distribution.
7. The technique of analysis of variance is developed by \_\_\_\_\_.
8. Poisson distribution is a limiting form of \_\_\_\_\_ distribution.
9. If co-efficient of correlation  $r = 0.9$  then co-efficient of determination is \_\_\_\_\_ %.
10. The probability of getting both heads when two coins are tossed simultaneously is \_\_\_\_\_.

(10 × 1 = 10 marks)

### Part II

*Answer any eight questions.  
Each question carries 2 marks.*

11. What is a programming techniques ?
12. What is Karl Pearson's co-efficient of correlation ?
13. What are the limitations of regression analysis ?
14. A sub-committee of 6 members is to be formed out of a group consisting of 7 men and 4 ladies. Calculate the probability that the sub-committee will consist of (i) exactly two ladies ; (ii) at least two ladies.
15. State addition theorem and find it for three events ?
16. If 20% of the articles produced by a machine are defective. Find the probability that out of 4 articles chosen at random (a) At most 2 are defective ; (b) Exactly 3 are defective.
17. If  $X \sim P(1)$  and  $Y \sim P(2)$ , then find  $P(X + Y < 3)$ .
18. Define sampling distribution of a statistic ?
19. What is Chi-square test ?
20. What is ANOVA ?

(8 × 2 = 16 marks)

### Part III

*Answer any six questions.  
Each question carries 4 marks.*

21. What are the limitations of quantitative techniques ?

22. The following table shows the respective IQ's of 10 fathers and their eldest sons. Calculate rank correlation co-efficient :

Father's IQ	:	91	97	102	103	103	105	110	114	116	124
Son's IQ	:	102	94	105	115	113	99	98	112	120	108

23. Two variables gave the following data  $r = 0.7$ . Obtain the two regression lines and find the most likely value of Y when X = 24 :

Variables →	X	Y
Mean	20	15
S.D.	4	3

24. The compensation received by 1000 workers in a factory are given in the following table :—

Wages	:	80-100	100-120	120-140	140-160	160-180	180-200
No. of Workers	:	10	100	400	250	200	40

Find the probability that a worker selected has (1) Wages under Rs. 100 (2) Wages above Rs.140 (3) Wages between Rs. 120 and Rs. 180.

25. A Systematic sample of 100 pages was taken from a dictionary and the observed frequency distribution of foreign words per page was found to be as follows: Calculate the expected frequencies using Poisson Distribution :

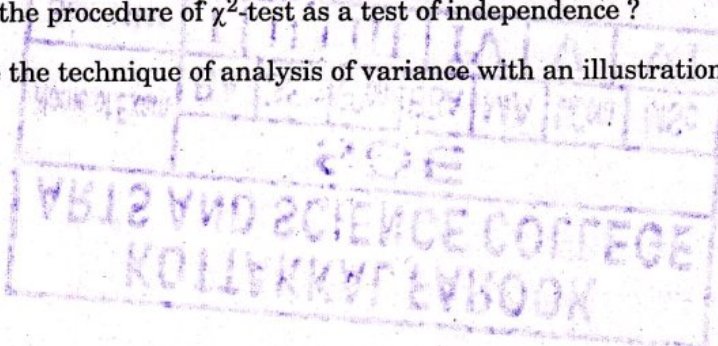
No. of foreign words per page (x)	:	0	1	2	3	4	5	6
Frequency (f)	:	48	27	12	7	4	1	1

26. A factory was producing electric bulbs of average length of 2000 hours. A new manufacturing process was introduced with the hope of increasing the length of the life of bulbs. A sample of 25 bulbs produced by the new process was examined and the average length of life was found to be 2200 hours. Examine whether the average length of bulbs was increased assuming the length of lives of bulbs follow normal distribution with  $\alpha = (0.05)$ .

27. Explain the procedure of  $\chi^2$ -test as a test of independence ?

28. Describe the technique of analysis of variance with an illustration for one-way classifications ?

(6 × 4 = 24 marks)



Turn over

## Part IV

Answer any two questions.  
Each question carries 15 marks.

29. Explain the procedure of fitting binomial distribution.

The following data shows the number of seeds germinating out of 10 on damp filter paper for 80 set of seeds. Fit a binomial distribution of data and find the expected frequencies :

X	:	0	1	2	3	4	5	6	7	8	9	10
f	:	6	20	28	12	8	6	0	0	0	0	0

30. Test whether the accidents occur uniformly over week days on the basis of the following information :—

Days of the week	:	Sun	Mon	Tue	Wed	Thu	Fri	Sat
No. of accidents	:	11	13	14	13	15	14	18

31. Given below is 16 pairs of values showing the performance of two machines A and B. Test whether there is difference between the performances. Table value of Wilcoxon "T" at 5% significant is 25 :

A : 73, 43, 47, 53, 58, 47, 52, 58, 38, 61, 56, 56, 34, 55, 65, 75

B : 51, 41, 43, 41, 47, 32, 24, 58, 43, 53, 52, 57, 44, 57, 40, 68

(2 × 15 = 30 marks)