

FOURTH SEMESTER UG DEGREE EXAMINATION, APRIL 2023

(Regular/Improvement/Supplementary)

BBA

GBBA4C04T: QUANTITATIVE TECHNIQUES FOR BUSINESS

Time: 2 ½ Hours

Maximum Marks: 80

SECTION A: Answer the following questions. Each carries two marks.

(Ceiling 25 Marks)

1. Mention any four statistical techniques for quantitative analysis.
2. What is semi average method in a time series?
3. Distinguish between additive and multiplicative model of a time series analysis.
4. From the following data construct an index:

Commodity	A	B	C	D	E
Price in 2013	50	60	40	20	90
Price in 2014	70	60	80	100	40

5. Give the formula of Laspeyre's and Paasche's index numbers.
6. A computer while calculating the correlation coefficient between two variables X and Y from 17 pairs of observations obtained the following results.

$$n = 17, \sum X = 544, \sum Y = 244, \sum X^2 = 19040, \sum Y^2 = 3773, \sum XY = 8413$$

Find the correlation coefficient.

7. What do you mean by regression coefficients?
8. Given the regression lines to be $2x + 18y = 326$ and $x + 2y = 33$. Find mean of x and y.
9. Distinguish between priory probability and posteriori probability.
10. The probability that a boy will get a scholarship is 0.8 and a girl will get is 0.9. What is the probability that at least one of them will get the scholarship?
11. Define conditional probability.
12. If A and B are two events such that $P(A) = 1/3$, $P(B) = 1/4$ and $P(A \cap B) = 1/8$. Find $P(A|B)$ and $P(A|B^c)$.
13. How would you use a Poisson distribution to find approximately the probability of exactly 5 successes in 100 trials, the probability of success in each trial being $p = 0.1$.
14. If the probability of defective bolt is 0.1. Find the mean and variance of defective both in a total of 900.
15. State the conditions for Poisson distribution being the approximation or limiting form of Binomial distribution.

(PTO)

**SECTION B: Answer the following questions. Each carries five marks.
(Ceiling 35 Marks)**

16. What are the business applications of quantitative techniques?
 17. From the following data, calculate trend by 3 - yearly moving averages.

Year:	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Quantity:	120	133	140	162	155	180	210	218	223	232

18. Fit a straight line trend for the following time series:

Year:	1994	1995	1996	1997	1998	1999	2000
Production:	10	13	12	14	12	16	14

19. The ranking of 10 individuals at the start and finish of a training program are as follows :

Individuals :	A	B	C	D	E	F	G	H	I	J
Rank before :	4	8	10	7	2	5	9	3	6	1
Rank after :	1	4	9	5	10	7	2	3	8	6

Calculate Spearman's Rank Correlation Coefficient.

20. From the following table calculate the coefficient of correlation by Karl Pearson's method. Arithmetic means of X and Y are 6 and 8 respectively.

X :	6	2	10	-	8
Y:	9	11	-	8	7

21. A committee of 5 is to be formed from a group of 8 boys and 7 girls. Find the probability that the committee consists of
 (a) 3 boys and 2 girls. (b) At least one girl.
22. A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $\frac{1}{7}$ and that of wife's selection is $\frac{1}{5}$. What is the probability that
 (i) Both of them will be selected.
 (ii) Only one of them will be selected.
 (iii) None of them will be selected.
23. A bag contains 20 yellow balls and 80 red balls. Three balls are drawn at random from the bag. Find the probability that of the three balls (a) At least one is red (b) At most 2 are red. (Use binomial distribution)

SECTION C: Answer any two questions. Each carries ten marks.

24. With the help of the following data, show that Fisher's index is an ideal index:

Commodity	Base Year		Current Year	
	Quantity	Price	Quantity	Price
A	8	4	10	9
B	7	3	8	5
C	6	4	5	8
D	5	2	7	4

25. You are given the data relating to purchases and sales. Obtain the two regression equations and estimate the likely sales when the purchases equal 100. Also find correlation coefficient.

Purchases :	62	72	98	76	81	56	76	92	88	49
Sales :	112	124	131	117	132	96	120	136	97	85

26. Assume that a factory has two machines. Past records show that machine I produces 30% of the items of output and machine II 70% of the items of output. Further, 5% of the items produced by machine I were defective and only 1% produced by machine II were defective. If a defective item is drawn at random, what is the probability that the defective item was produced by machine I?

27. The income of a group of 10000 persons was found to be normally distributed with mean Rs. 750 and standard deviation Rs. 50. Show that this group about 95% had income exceeding Rs. 668 and only 5% has income exceeding Rs. 832. What was the lowest income among the richest 100?

(2 x 10 = 20 Marks)