

FOURTH SEMESTER B.Com DEGREE EXAMINATION, APRIL 2023

(Regular/Improvement/Supplementary)

FINANCE & COMPUTER APPLICATION

GBCM4C04T: 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. Give any two applications of quantitative techniques in business.
2. What is scatter diagram?
3. Calculate the correlation coefficient between the variables X and Y from the following data :
 $n = 30, \sum X = 118, \sum Y = 93, \sum X^2 = 556, \sum Y^2 = 309, \sum XY = 368$
4. Distinguish between positive and negative correlation.
5. What do you mean by regression coefficients?
6. From the following regressions, calculate \bar{X} and \bar{Y} .
 $20x - 9y - 107 = 0$ and $4x - 5y + 33 = 0$
7. State axiomatic definition of probability.
8. A die is thrown. Find the probability of getting
 (i) Four (ii) An even number (c) 3 or 5 (d) Less than three
9. Let A and B be events with $P(A) = 1/2, P(B) = 1/3$ and $P(A \cap B) = 1/4$. Find $P(A|B)$.
10. In a town 10 accidents took place in a span of 100 days. Assuming that the number of accidents follows Poisson, find the probability that there will be at least 1 accidents in a day.
11. Find the area to the left of $z = 1.84$.
12. Find the probability that the number of heads lie in the range 150 and 180 when a fair coin is tossed 300 times.
13. What is linear programming problem?
14. What is operations research?
15. Distinguish between decision making under certainty and decision making under uncertainty.

SECTION B: Answer the following questions. Each carries *five* marks.

(Ceiling 35 Marks)

16. Describe some of the important statistical techniques for quantitative analysis.
17. What are the limitations of quantitative techniques?
18. Compute Karl Pearson's coefficient of correlation between two variables X and Y to the following data.

X :	61	68	79	59	69	96	89	78
Y :	108	123	136	107	112	156	137	125

(PTO)

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. An urn contains 10 balls , three of which are white ,three blue and four black. Three balls are drawn at random from the urn. What is the probability that-

- (i) the three balls are of different colours?
- (ii) two balls are of the same colour and third of different?
- (iii) the balls are all of the same colour?

21. A book contains 400 misprints distributed randomly throughout its 400 pages. What is the probability that a page observed at random contain at least 2 misprints?

22. X is a normal variate with mean 42 and standard deviation 4. Find the probability that a value taken by

- (i) Less than 40
- (ii) Greater than 50
- (iii) Between 43 and 46
- (iv) Between 40 and 44

23. A home resourceful decorator manufactures two types of lamps say A and B. Both lamps go through two technicians first a cutter and second a finisher. Lamp A requires 2 hours of the cutter's time and 1 hour of the finisher's time; lamp B requires 1 hour of cutter's and 2 hours of finisher's time. The cutter has 104 hours and finisher has 76 hours of available time each month. Profit on the lamp A is Rs. 6 and on lamp B is Rs. 11. Formulate a mathematical model.

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

24. The following data gives the age and blood pressure of 10 persons :

Age	56	42	36	47	49	42	60	72	63	55
B/P	147	125	118	128	145	140	155	160	149	150

- (i) Determine regression equations.
- (ii) Find correlation coefficient between age and blood pressure.

25. Three machines A , B , C produce 50% , 30% , 20% respectively of the total production of a factory. It is estimated that A produces 2% defectives, B produces 3% defectives and C produces 4% defectives in their production. An item chosen randomly from the total production is found to be defective. What is the probability that it has come from machine C?

26. Fit a Binomial distribution to the following data :

X :	0	1	2	3	4
f :	8	32	34	24	5

27. A food products company is planning the introduction of a revolutionary new product with new packing to replace the existing product at much higher price (S_1) or a moderate change in the composition of the existing product with a new packaging at a small increase in price (S_2) or a small change in the composition of the existing except the word, 'New' with a negligible increase in the price (S_3). The three possible states of nature of events are (i) high increase in sales (N_1) (ii) no change in sales (N_2) (iii) decrease in sales (N_3). The marketing department of the company worked out the payoffs in terms of yearly new profits for each of the strategies on these events. This represented in the following table.

Payoffs			
Strategies	States of nature		
	N_1	N_2	N_3
S_1	700	300	150
S_2	500	450	0
S_3	300	300	300

Which strategy should the executive concerned choose on the basis of

- (a) Maxi min Criterion
- (b) Maxi max Criterion
- (c) Mini max Regret Criterion
- (d) Laplace Criterion
- (e) Hurwicz Criterion ($\alpha = 0.6$)

(2 x 10 = 20 Marks)