

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2023

(Regular/Improvement/Supplementary)

B.Com Professional

GBCP2B08T : QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : 3 Hours

Maximum Marks: 80

PART A: Answer all the questions. Each carries one mark.**Choose the correct answer.**

1. When the amount of change in one variable leads to a constant ratio of change in the other variable, the correlation is said to be.....
(a) Positive (b) Negative (c) Linear (d) Non - linear
2. The set containing all the sample points of a random experiment is called.....
(a) Sample space (b) Sample point (c) Probability (d) None of these
3. What is the probability of a unit to be included in a sample of size n taken from the population of size N using simple random sampling?
(a) n/N (b) $1/N$ (c) $1/n$ (d) None of these
4. An estimator is said to be..... if its expected value is identical with the population parameter being estimated.
(a) Unbiased (b) Consistent (c) Efficient (d) Sufficient
5. is committed by accepting a false hypothesis.
(a) Type I error (b) Type II error (c) Both (d) None of these
6. If A and B are independent events such that $P(A) = P(B) = 1/2$, then $P(A \cup B) =$
7. When the probability of success in a Bernoulli process is 50% ($p = 0.5$), its binomial distribution is
8. A estimate is a single number which is used as an estimate of the unknown population parameter.
9. Student's t test was invented by.....
10. State true or false : Non parametric tests are distribution free.

(10 × 1 = 10 Marks)**PART B: Answer any eight questions. Each carries two marks.**

11. The coefficient of correlation between X and Y is 0.87, $\sigma_x = 3$, $\sigma_y = 3.06$ find b_{xy} .
12. In tossing three coins at a time, what is the probability of getting at most one head ?
13. What are the uses of Normal distribution?

(PTO)

14. The incidence of occupational disease in an industry is such that the workman has 25% chance of suffering from it. What is the probability that out of six workmen 4 or more will contract the disease?
15. Give merits and demerits of stratified random sampling.
16. Give the formula for finding the confidence interval for the mean of a Normal population when population standard deviation is unknown and sample size is small.
17. What are the uses of standard error?
18. Define degrees of freedom.
19. Define power of a test?
20. State any two applications of Chi - square distribution.

(8 × 2 = 16 Marks)

PART C: Answer any six questions. Each carries four marks.

21. What are the limitations of quantitative techniques?
22. What are the common techniques of operations research?
23. Obtain the equation of the lines of regression for the data given below :

X :	1	2	3	4	5	6	7	8	9
Y :	9	8	10	12	11	13	14	16	15

24. The customer accounts at a certain departmental store have an average balance of Rs. 120 and standard deviation of Rs. 40. Assuming that the account balances are normally distributed.
 - (i) What proportion of the accounts is over Rs.150.
 - (ii) What proportion of accounts are in between Rs. 100 and Rs. 150?
25. Out of 800 families with four children each, what percentage would be expected to have
 - (a) 2 boys and 2 girls
 - (b) At least one boy
 - (c) No girls
 - (d) At most 2 girls.
 Assume equal probabilities for girls and boys.
26. Distinguish between census and sampling.
27. What is t distribution? Explain its uses.
28. The mean life time of a sample of 400 fluorescent light bulbs produced by a company is found to be 1570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean life time of the bulbs produced by the company is 1600 hours against the alternative hypothesis that it is greater than 1600 hours at 1% level of significance.

(6 × 4 = 24 Marks)

PART D: Answer any two questions. Each carries fifteen marks.

29. The following table gives the distribution of items of production and also the relative defective items among them, according size groups. Find the correlation coefficient between size and percentage of defect in quality.

Size - group :	15 - 16	16 - 17	17 - 18	18 - 19	19 - 20	20 - 21
No. of items :	200	270	340	360	400	300
No. of defective items :	150	162	170	180	180	114

30. 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?
31. The following table represents the number of production per day turned out by 4 different workers using 5 different types of machines.

Worker	Machine types				
	A	B	C	D	E
1	4	5	3	7	6
2	6	8	6	5	4
3	7	6	7	8	8
4	3	5	4	8	2

On the basis of this information, can it be concluded that:

- (a) The mean productivity is the same for different machines.
(b) The mean productivity is different with respect to different workers.

(2 × 15 = 30 Marks)