Reg. No ....   Name **22P1059**

M. COM DEGREE END SEMESTER EXAMINATION : OCTOBER 2022
SEMESTER 1 : COMMERCE
COURSE : 21P1COMT05: QUANTITATIVE TECHNIQUES
(For Regular - 2022 Admission and Supplementary - 2021 Admission)

Duration : Three Hours   Max. Weights: 30

PART A
Answer any 8 questions   Weight: 1

1.	Mention two uses of Quantitative Techniques to Businessmen.	(A, CO 2, CO 3)
2.	Why is classical probability also called "a priori" probability?	(U, CO 3)
3.	If our population has 45% females and 55% males then our sample should reflect the same percentage of males and females. Identify the sampling technique and explain its meaning.	(A, CO 3)
4.	A committee of 3 members is to be made out of 6 men and 5 women. What is the probability that the committee has at least two women?	(U, CO 3)
5.	Distinguish between a Parameter and a Statistic	(An, CO 4)
6.	What is type II error?	(U, CO 4)
7.	Explain the terms population and sample.	(U, CO 3)
8.	What do you mean by Contingency table?	(U, CO 3)
9.	Test the consistency of the following data with the symbols having their usual meaning. N = 1000 (A) = 600 (B) = 500 (AB) = 50	(A, CO 3, CO 4)
10.	Differentiate between Association and Disassociation.	(E, CO 3)

(1 x 8 = 8)

PART B
Answer any 6 questions   Weights: 2

11.	Explain the role of Quantitative Techniques in Business Management.	(An, CO 1, CO 3)
12.	When a machine is set correctly, it produces 25% defectives, otherwise it produces 60% defectives. From the past knowledge and experience, the manufacturer knows that the chance that the machine is set correctly or wrongly is 50 : 50. The machine was set before the commencement of production and 1 piece was taken out and found to be defective. What is the probability of the machine set up being correct? If the selected piece was found to be non-defective, what is the probability of the machine set up being wrong?	(Cr, CO 2)
13.	There are 2 identical boxes. One box contains 5 red and 3 black balls. The second box contains 6 red and 4 black balls. One box is chosen and one ball is drawn. That ball drawn was red. What is the probability that number I box was chosen?	(A, CO 5)

14. Case Analysis

   On April 20, 1999, Eric Harris and Dylan Klebold entered Columbine High School and began shooting teachers and students. Thirteen individuals died, and the psychological community was again asked to explain such violent behavior. A psychologist might decide to interview Columbine students to obtain their perspectives on the factors that motivated the two young men to commit such a horrendous act. A group of ten students has already decided to meet and discuss the events of that day. The psychologist asks if it would be all right to attend the meeting and ask them some questions. The students agree, and the psychologist records their thoughts. Based on this information, the psychologist concludes that a primary reason for the violent behavior was the peer dynamics in the school that created groups of outcasts.   (Cr)

   Critical Questions

   1. Who appears to constitute the population of interest?

   2. Which type of sampling procedure best describes that used by the psychologist?

   3. What are the limitations of this sampling method, and in what specific ways could

      the sampling method have affected the findings?

    4. What specific steps would you have taken to obtain a representative sample?

15. A factory manager wishing to buy machines for a certain operation in a production process, obtains one machine from each of the four companies making such machines and puts three men each of whom works one day each of the four machines in a random order. The resulting units of production are given below.

Machines	Workers		
	W1	W2	W3
M1	62	63	64
M2	64	66	68
M3	67	67	70
M4	68	69	69

   (An, CO 4)

   Discuss the significance of variance of production among the different types of machines and also among the workers.

16. The following are the numbers of tickets issued by two sales men on 11 days.

Salesman I	7	10	14	12	6	9	11	13	7	6	10
Salesman II	10	13	14	11	10	7	15	11	10	9	8

   (A, CO 1, CO 3)

   Use the sign test at 1% level of significance to test the null hypothesis that on the average the two salesmen issue equal number of tickets.

17. In a four round golf-play scores of 11 professionals are 202, 210,201,203,193,203,204,196,199,202,201. Use the sign test at 5% level of significance to test the null hypothesis that professional golfers' average is 204.   (A, CO 2, CO 3)

18. In an examination at which 600 candidates appeared of them 348 were boys. Number of passed candidates exceeded the number of failed candidates by 310. Boys failing in the examination numbered 88. Find the coefficient of association between male gender and success in examination. (U, CO 4)

(2 x 6 = 12)

PART C
Answer any 2 questions   Weights: 5

19. How has quantitative analysis changed the current scenario in the management world today? (Cr, CO 4)

20. A talcum powder manufacturing company had launched a new type of advertisement. The company estimated that a person who comes across the advertisement will buy their product with a probability of 0.7 and those who does not see the advertisement will buy the product with a probability of 0.3. If in an area of 1,000 people, 70% had come across the advertisement, what is the probability that a person who buys the product (a) has not come across the advertisement (b) has come across the advertisement? (A, CO 3, CO 5)

21. Four brands of flashlight batteries are to be compared by testing each brand in five flashlights. Twenty flashlights are randomly selected and divided randomly into four groups of five flashlights each. Then each group of flashlights uses a different brand of battery. The lifetimes of the batteries, to the nearest hour, are as follows.

Brand A	Brand B	Brand C	Brand D
42	28	24	20
30	36	36	32
39	31	28	38
28	32	28	28
29	27	33	25

(A, CO 1, CO 5)

Preliminary data analyses indicate that the independent samples come from normal populations with equal standard deviations. At the 5% significance level, does there appear to be a difference in mean lifetime among the four brands of batteries?

22. Given below is 16 pairs of values showing the performance of two machines. Test whether there is difference between the performances.

Machine A	73	43	47	53	58	47	52	58	38	61	56	56	34	55	65	75
Machine B	51	41	43	41	47	32	24	58	43	53	52	57	44	57	40	68

(A, CO 1, CO 3)

Use Wilcoxon matched-pairs test, at 5% level of significance.

(5 x 2 = 10)

OBE: Questions to Course Outcome Mapping

CO	Course Outcome Description	CL	Questions	Total Wt.
CO 1	Understand various quantitative & statistical methods	U	11, 16, 21, 22	14
CO 2	Understand data and draw inference from data	U	1, 12, 17	5

CO 3	Applies statistical values by using statistical tools	A	1, 2, 3, 4, 7, 8, 9, 10, 11, 16, 17, 20, 22	24
CO 4	Demonstrate their competence and confidence in using descriptive statistics	A	5, 6, 9, 15, 18, 19	12
CO 5	Summarizes from data the important trends in order to forecast as accurately as possible	E	13, 20, 21	12

Cognitive Level (CL): Cr - CREATE; E - EVALUATE; An - ANALYZE; A - APPLY; U - UNDERSTAND; R - REMEMBER;