25025268

QP CODE: 25025268

Reg No : .....

Name : .....

M.Com DEGREE (CSS) EXAMINATION, MAY 2025

Second Semester

CORE - CM010204 - QUANTITATIVE TECHNIQUES

M.COM FINANCE AND TAXATION ,M.COM MANAGEMENT AND INFORMATION TECHNOLOGY,M.COM MARKETING AND INTERNATIONAL BUSINESS,M.COM MASTER OF COMMERCE AND MANAGEMENT

2019 ADMISSION ONWARDS

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Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What is a random variable? Give examples.
2. Write down the density function of the Normal Distribution stating the parameters therein.
3. In a normal distribution, find (i) P ($z \leq 1.85$), (ii) P ($z \geq 2.03$).
4. What is level of significance?
5. A random sample of 15 pairs of observation from a normal population gives a correlation coefficient 0.62. Is the correlation significant?
6. Write in brief 'Chi square test for Homogeneity of several population proportions'.
7. When can run test be applied?
8. Explain double sampling plan.
9. What is multi-variate analysis?
10. What is multiple regression?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Out of 1000 houses only one house catches fire in a year. Find the probability that out of the 500 houses, exactly four houses would catch fire?

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

13. The mean yield of wheat from a district A was 210 lbs with standard deviation =10 per acre from a sample of 100 plots. In another district B, the mean yield was 200 lbs, standard deviation = 12 lbs from a sample of 150 plots. Assuming that the standard deviation of yield in the entire state was 11 lbs, test whether there is any significant difference between the mean yields of the crops in the two districts.

14. In 3 samples of 50 lines each from Shakespeare's early play ' Romeo & Juliet', the following no. of weak endings were observed – 7, 9 & 10. In 3 samples from Cymbeline, a later play, the no. of weak endings were 15, 11 & 12. Discuss the suggestion that Shakespeare's prosody as judged by no. of weak endings increased with advancing years.

15. In a random sample of 600 men from a large city, 450 were found to be smokers. In a random sample of 900 from another large city 450 were found to be a smokers. Do the data indicate that the cities are significantly different in respect of the prevalence of smoking among men?

16. The number of scooter accidents per month in a certain city is as under
12,8,20,2,14,10,15,6,9,4
Do you agree that the accident conditions were the same during the 10 month period.

17. What is SQC? State its scope.

18. How does factor analysis simplify research findings?

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. The screws produced by a certain machine were checked by examining samples. The following table shows the distribution of 128 samples according to the number of defective items they contained. Fit a binomial distribution.

No. of Defectives	0	1	2	3	4	5	6	7
No. of Samples	7	6	19	35	30	23	7	1

20. Below are given the yield (in kgs) per acre for 5 trial plots of 4 varieties of treatment.

	Treatment			
Plot No	I	II	III	IV
1	42	48	68	80
2	50	66	52	94
3	62	68	76	78
4	34	78	64	82
5	52	70	70	66

Carry out two way analysis of variance and state your conclusion.

21. Two researchers adopted different sampling techniques while investigating the same group of students to find the number of students falling in different intelligence levels. The results are as follows

Researcher	Below average students	Average students	Above average students	Genius students	Total
X	86	60	44	10	200
Y	40	33	25	2	100
Total	126	93	69	12	300

Would you say that the sampling techniques adopted by the two researchers are significantly different? (Given 5% values of Chi-Square for 3 d.f. and 4 d.f. are 7.82 and 9.49 respectively)

22. The mean and range of observations relating to 6 samples of size 10 relating to a production process are given below. Advise the quality control manager using mean and range charts.
Use for n=10 $A_2 = 0.308$, $D_3 = 0.223$, $D_4 = 1.777$

Samples	1	2	3	4	5	6
Mean	11.6	17.4	14.8	13.8	13.9	16.6
Range	14.1	19.1	22.9	18	14.6	21

(2×5=10 weightage)