D 93088

(Pages : 3)

FIRST SEMESTER M.Com. DEGREE EXAMINATION, DECEMBER 2015

(CUCSS)

MC IC 2—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2015 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

*Answer **all** questions.*
Each question carries 1 weightage.

1. Distinguish between correlation and regression.

2. What is meant by sampling distribution of sample means ? Explain its role in statistical inference.

3. What is ANOVA? For what purpose is it used ?

4. What are non-parametric tests ? What are its salient features ?

5. Explain the concept of 'degrees of freedom'.

6. What is a hypothesis ? Distinguish between null and alternative hypotheses.

(6 × 1 = 6 weightage)

Part B

*Answer any **six** questions.*
Each question carries 3 weightage.

7. List and explain the qualities of a good estimator.

8. Explain how sample size is determined using suitable examples.

9. What are the applications of Chi-square test ? What are its limitations ?

10. In a sample survey of 1000 housewives in a city, 23 % preferred a particular brand of pressure cooker. Find 99 % confidence limits for the percentage of all housewives in the city preferring that brand of cooker.

Turn over

11. An inspection of 10 samples of size 400 each from 10 lots revealed the following number of defective units : 17, 15, 14, 26, 9, 4, 19, 12, 9 and 15. Calculate control limits for the number of defective units. Plot the control limits and the observations and state whether the process is under control or not.

12. The heights of six randomly chosen sailors are in inches : 63, 65, 68, 69, 71 and 72. Those of 10 randomly chosen soldiers are: 61, 62, 65, 66, 69, 69, 70,71, 72 and 73. Discuss in the light of these data whether sailors are on the average taller than soldiers. one tail

13. In a sample of 500 people in a certain district, 280 are tea drinkers and the rest are coffee drinkers. Can we assume that both coffee and tea are equally popular in this district at 1 % level of significance ?

14. A random sample of 100 recorded deaths in a certain city during the past year showed an average life span of 71.8 years with a standard deviation of 8.9 years. Does this seem to indicate that the average life-span today is greater than 70 years ? Use a 0.05 level of significance.

(6 × 3 = 18 weightage)

Part C

Answer any **two** *questions.*
Each question carries 6 weightage.

15. A department store gives service to its salesmen which is followed by a test. It is considering whether it should terminate the services of any salesman who does not do well on the test. The following data gives the test scores and sales made by nine salesmen during a certain period :

Test scores	14	19	24	21	26	22	15	20	19
Sales ('000 Rs)	31	36	48	37	50	45	33	41	39

Calculate the co-efficient of correlation between the test scores and the sales. Does it indicate that termination of services of low test scores is justified ? If the firm wants a minimum sales volume of Rs. 3,000, what is the minimum test score that will ensure continuation of service ?

16 Random samples of four brands of cigarettes were tested for tar content. The following figures show the milligrams of tar found in the 16 cigarettes tested :

Brand A	Brand B	Brand C	Brand D
14	16	16	17
10	18	15	20
11	14	14	19
13	15	12	21

Use the Kruskal-Wallis test, at the 0.05 level of significance, to test whether there is a significant difference in tar content among the four brands of cigarettes.

17 What is 'Statistical Quality Control' ? Describe the various steps in the preparation of control charts for the mean and range. How will you interpret these charts ?

(2 × 6 = 12 weightage)

C 32470

Name...

Reg. No.......................................

FIRST SEMESTER M.Com. DEGREE EXAMINATION, DECEMBER 2017

(CUCSS)

MC 1C2—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2015 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer all questions.
Each question carries 1 weightage.

1. Explain the term 'Level of Significance'.

2. Write short note on 'Confidence Interval of a parameter'.

3. What are non-parametric tests ?

4. Explain $\overline{X}$ – chart.

5. Differentiate positive correlation from negative correlation.

6. What is meant by analysis of variance ?

(6 × 1 = 6 weightage)

Part B

Answer any six questions.
Each question carries 3 weightage.

7. Explain the procedure of Kruskal-Wallis test.

8. Explain the features of SPSS. Also list the important difficulties while using SPSS.

9. What is 'Statistical Quality Control' ? Describe the preparation of Range-chart.

10. The following are the numbers of tickets issued by two sales men on II days :

    I Salesman :   7   10   14   12   6   9   11   13   7   6   10

    II Salesman :   10   13   14   11   10   7   15   11   10   9   8

    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.

Turn over

11. Random samples of 250 bolts manufactured by machine A and 200 bolts manufactured by machine B showed 24 and 10 defective bolts respectively. Test the hypothesis that the machines are showing different qualities of performance. Use 5 percent level of significance.

12. Below are given the yields per acre of wheat for six plots entering a crop competition, three of the plots being sown with wheat of variety A and three with B :

Variety	Yield in field per acre		
	1	2	3
A	30	32	22
B	20	18	16

Set up a table of analysis of variance and calculate F. State whether the difference between the yields of the two varieties is significant taking 7.71 as the table of F at 5 % level for $V_1 = 1$ and $V_2 = 4$.

13. A bag contains defective articles the exact number of which is not known. A sample of 400 from the bag gives 40 defective article. Estimate the percentage of defective articles in the bag and assign limits within which the percentage probably lies.

14. Calculate the coefficient of correlation from the following data :

x	:	1	2	3	4	5
y	:	6	8	11	8	12

(6 × 3 = 18 weightage)

Part C

*Answer any **two** questions.*

Each question carries 6 weightage.

15. The following table gives the classification of 200 students according to grades secured in an oral examination and to their year of graduation :

Year	Grade				Total
	A	B	C	D	
I	5	15	15	15	50
II	15	20	25	10	70
III	30	25	20	5	80
Total	50	60	60	30	200

Test the hypothesis that the grades secured by students is independent of their year of graduation.

16. From the data given below find :

(a) The two regression equations.

(b) The coefficient of correlation between marks in Economics and Statistics.

(c) The most likely marks in statistics when the marks in Economics are 30 :

Marks in Economics	:	25	28	35	32	31	36	29	38	34	32
Marks in Statistics	:	43	46	49	41	36	32	31	30	33	39

17. Discuss the importance of quantitative techniques in taking business decisions. What are the limitations of quantitative techniques ?

(2 × 6 = 12 weightage)

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(Pages : 3)

Name....................................

Reg. No..................................

FIRST SEMESTER M.Com. DEGREE EXAMINATION, NOVEMBER 2018

(CUCSS—PG)

M.Com.

MC 1C 02—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2015 Syllabus Year)

Time : Three Hours

Maximum : 36 Weightage

Part A

*Answer **all** questions.*

Each question carries 1 weightage.

1. Distinguish between 'point estimate' and 'interval estimate'.

2. Distinguish between a 'Parameter' and a 'Statistic'.

3. Explain the term 'Standard error'.

4. Explain Type I and Type II errors.

5. What is Chi-square test ?

6. What is C-Chart ? When is it used ?

(6 × 1 = 6 weightage)

Part B

*Answer any **six** questions.*

Each question carries 3 weightage.

7. Write a note on SPSS.

8. Explain the procedure followed in testing of a hypothesis.

9. Write notes on the following :—

   (a) Mann-Whitney U-test.

   (b) Kruskal-Wallis K-test.

Turn over

10. On 15 Occassions Mr. X had to wait 9, 5, 3, 8, 8, 6, 9, 7, 2, 10, 7, 7, 6, 10, 6 minutes for bus. Use the sign test at 5 % level of significance to test the bus's claim that on the average Mr. X has to wait 5 minutes.

11. Two laboratories are independently producing drugs that provide relief to arthritis sufferers. The first drug is tested on 200 arthritis victims and 120 got relief. The second drug is tested on 150 victims and 80 got relief. Test that the effectiveness of two drugs at 5 % level of significance does not differ significantly.

12. From the following data find out the rank correlation co-efficient :

X	:	50	60	65	50	55	60	50	30	40
Y	:	10	20	25	15	20	30	35	5	7

13. In an experiment on the immunization of goats from anthrax, the following results were obtained. Derive your inference on the efficiency of the vaccine.

		Died	Survived	Total
Innoculated	...	2	10	12
Net Innoculated	...	6	6	12
Total	...	8	16	24

14. The increase in weights due to two kinds of food are given below. Can it said that food B is better than food A ?

Food A :	49	53	51	52	47	50	52	53
Food B :	52	55	52	53	50	54	54	53

(6 × 3 = 18 weightage)

Part C

*Answer any **two** questions.*
Each question carries 6 weightage.

15. To study the performance of three detergents and three water temperature the following whiteness readings were obtained with specially designed equipment :

Water Temperature		Detergent A	Detergent B	Detergent C
Cold Water	...	57	55	67
Warm Water	...	49	52	68
Hot Water	...	54	46	58

Perform a two way analysis of variance using 5 % level of significance (Given : $F = 6.94$).

16. You are given the data relating to purchases and sales. Obtain the two regression equations by the method of least squares and estimate the likely sales when the purchases equal 100.

Purchases	:	62	72	78	76	81	56	76	92	88	49
Sales	:	112	124	131	117	132	96	120	136	97	85

17. Explain the role of quantitative techniques in the field of business and industry in modern times. Give a few examples in support of your answer.

(2 × 6 = 12 weightage)

M.Com. (PREVIOUS) DEGREE [CBCSS] EXAMINATION, APRIL/MAY 2020

(PVT/SDE)

M.Com.—First Semester

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admissions)

Time : Three Hours   Maximum : 30 Weightage

Part B

Section A

Answer any **four** *questions.*
Each question carries 2 weightage.

1. Define Binomial Distribution. State the conditions under which binomial probability model is appropriate.

2. Distinguish between one-tailed test and two-tailed test.

3. Write down the significance of the Analysis of Variance.

4. Why Correlation is used ? Explain partial correlation.

5. Compare SPSS with MS Excel.

6. What is type II error ? Explain.

7. Distinguish between parametric test and non-parametric test.

(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries 3 weightage.

8. Explain SPSS in detail. Write down the steps to perform a simple regression and explain descriptive statistics.

9. The overall percentage of failures in a certain examination is 30. What is the probability that out of a group of 6 candidates at least 4 passed the examination ?

Turn over

10. A car hire firm has two cars, which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5. Calculate the proportion of days on which no car is used and the proportion of days on which some demand is refused, $[e^{-1.5} = 0.2231]$.

11. The heights of 10 males of a given locality are found to be 70, 67, 62, 68, 61, 68, 70, 64, 64, 66 inches. Is it reasonable to believe that the average height is greater than 64 inches ? Test at 5 % significance level, assuming that for 9 degrees of freedom $P(t > 1.83) = 0.05$.

12. The data below gives the marks obtained by 10 students taking Maths and Physics test :

Students	A	B	C	D	E	F	G	H	I	J
Maths mark (out of 30)	20	23	8	29	14	11	11	20	17	17
Physics mark (out of 40)	30	35	21	33	33	26	22	31	33	36

Is there a connection between the marks gained by ten students of maths and physics tests ?

13. What is Analysis of Variance (ANOVA) ? Explain Randomly Randomized Model and Randomized Block Model.

14. A producer confesses that 22 % of the items manufactured by him will be defective. To test his claim a random sample of 80 items were selected and 20 items were noted to be defective. Test the validity of the producer's claim at 1% level of significance.

(4 × 3 = 12 weightage)

Section B

*Answer any **two** questions.*
Each question carries 5 weightage.

15. In two sets of variables X and Y with 50 observations each, the following data were observed.

$\bar{x} = 10$, S.D. of $x = 3$, $\bar{y} = 6$, S.D. of $x = 2$.

Co-efficient correlation between X and Y is 0.3. However, on subsequent verification it was found that one value of X (= 10) were inaccurate and hence weeded out. With remaining 49 pairs of values, how is the original value of correlation coefficient affected.

16. Set up an analysis of variance table for the following two-way design results :

Per Acre Production Data of Wheat

Varieties of seeds	A	B	C
Verities of fertilizers			
W	6	5	5
X	7	5	4
Y	3	3	3
Z	8	7	4

Also state whether variety differences are significant at 5 % level. (All the figures are in metric tonnes).

17. Following is the distribution of students according to their height and weight :

Weight in lbs

Heights in inches	90 - 100	100 - 110	110 -120	120 - 130
50 - 55	4	7	5	2
55 - 60	6	10	7	4
60 - 65	6	12	10	7
65 - 70	3	8	6	3

Calculate :

    (i) The co-efficient of regression ; and

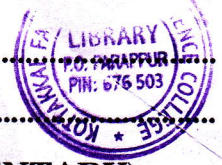   (ii) Obtain the two regression equations.

(2 × 5 = 10 weightage)

D 93369 (Pages : 3) Name..................

Reg. No..................

FIRST SEMESTER M.Com. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2020

(CBCSS)

M.Com.

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admissions)

Time : Three Hours   Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend **all** questions in each section.*

2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*

3. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Section A

*Answer any **four** questions.*
Each question carries 2 weightage.

1. Define is Poisson Distribution ?

2. Differentiate between Simple hypothesis and composite hypothesis.

3. What is ANOVA ? Explain the Two-factor ANOVA.

4. Why Correlation is used ? Explain partial correlation.

5. Compare SPSS with MS Excel.

6. What is Type II error ? Explain.

7. Distinguish between parametric test and non-parametric test.

(4 × 2 = 8 weightage)

Section B

*Answer any **four** questions.*
Each question carries 3 weightage.

8. What is SPSS and what are its usage ? Explain data view and variable view in detail.

9. The school nurse thinks the average height of 7th graders has increased. The average height of a 7th grader five years ago was 145 cm with a standard deviation of 20 cm. She takes a random sample of 200 students and finds that the average height of her sample is 147 cm. Are 7th graders now taller than they were before ? Conduct a single tailed hypothesis test using a .05 significance level to evaluate the null and alternative hypotheses.

Turn over

10. Use the sign test to see if there is a difference between the number of days required to collect an account receivable before and after a new collection policy. Use the 0.05 significance level.

    Before : 33 36 41 32 39 47 34 29 32 34 40 42 33 36 27

    After : 35 29 38 34 37 47 36 32 30 34 41 48 37 35 28

11. The following information is obtained concerning as investigation of ordinary shops of small size :

	Shops		Total
	In towns	In villages	
Run by men	17	18	35
Run by women	3	12	15
Total	20	30	50

Can it be inferred that shops run by women are relatively more in villages than in towns ? Use χ^2 test.

12. A car hire firm has two cars, which it hires out day by day. The number of demands for a car on each day is distributed as a Poisson distribution with mean 1.5. calculate the proportion of days on which no car is used and the proportion of days on which some demand is refused. [$e^{-1.5} = 0.2231$]

13. Define the role and significance of quantitative decision methods. Distinguish between the qualitative and quantitative approaches of decision making.

14. A random sample of 10 boys had the following I.Q.'s : 70, 120, 110, 101, 88, 83, 95, 98, 107, 100. Do these data support the assumption of a population mean I.Q. of 100? Find a reasonable range in which most of the mean I.Q. values of samples of 10 boys lie.

(4 × 3 = 12 weightage)

Section C

Answer any two questions.
Each question carries 5 weightage.

15. Ten competitors in a beauty contest are ranked by three judges in the following orders :

    1st judge : 1 6 5 10 3 2 4 9 7 8

    2nd judge : 3 5 8 4 7 10 2 1 6 9

    3rd judge : 6 4 9 8 1 2 3 10 5 7

Use the correlation co-efficient to determine which pair of judges has the nearest approach to common taste in beauty.

16. Set up an analysis of variance table for the following two-way design results :

Per Acre Production Data of Wheat

Varieties of seeds	A	B	C
Varities of fertilizers			
W	6	5	5
X	7	5	4
Y	3	3	3
Z	8	7	4

Also state whether variety differences are significant at 5% level. (All the figures are in metric tonnes)

17. Following is the distribution of students according to their height and weight :

Heights in inches	Weight in lbs			
	90–100	100–110	110–120	120–130
50–55	4	7	5	2
55–60	6	10	7	4
60–65	6	12	10	7
65–70	3	8	6	3

Calculate :

i) The co-efficient of regression ; and

ii) Obtain the two regression equations.

(2 × 5 = 10 weightage)

C 5514   (Pages : 3 + 4 = 7)   Name..

Reg. No....................................

M.Com. (PREVIOUS) DEGREE [IMPROVEMENT/SUPPLEMENTARY] EXAMINATION, APRIL/MAY 2021

M.Com.

MC 1C2—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISION

(2015 Admissions)

Time : Three Hours   Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 2 *marks.*

1. What are fraction defective charts ?

2. What is non-linear regression ?

3. How to determine sample size with confidence level approach ?

4. What is W value ?

5. What are random variations ?

                                                                 (5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*
Each question carries 10 *marks.*

6. (a) What is Co-efficient of Determination ($\gamma 2$) ?

   (b) From a random sample of 36 service personnel, the mean age and sample standard deviation is found to be 40 years and 4.5 years respectively. Construct 95 percent confidence interval limit for the mean age of service personnel.

7. Ascertain the reasons for the correlation identify between two variables.

8. Explain common types of Control Charts.

9. Differentiate estimator and estimate. What are the properties of good estimator ?

                                                                         Turn over

10. From the following data, obtained from a sample of 1000 persons calculate the standard error of the mean :

Earrings (Rs) :	0–10	10–20	20–30	30–40	40–50	50–60	60–70	70-80
No of persons :	50	100	150	200	200	100	100	100

If the average of the population were Rs. 42, what conclusion you can arrive about the reliability of the sample ?

11. The sales data of an item in six shops before and after a special promotional campaign are :

Shops :	A	B	C	D	E	F
Before promotional campaign :	53	28	31	48	50	42
After promotional campaign :	58	29	30	55	56	45

Can the campaign be judged to be a success ? Test at 5 % significance. Use paired t test as well as A-test.

$(4 \times 10 = 40 \text{ marks})$

Part C

Answer any **two** *questions.*
Each question carries 15 *marks.*

12. A training program is conducted for 16 teachers, and 2 tests are conducted - one before and one after training and the results are given below :

sl. no	score before	score after	sl. no	score before	score after
1	85	82	2	76	79
3	64	68	4	59	52
5	72	75	6	68	69
7	43	40	8	54	53
9	57	50	10	61	67
11	71	74	12	82	83
13	39	54	14	51	59
15	54	51	16	57	58

Is the training effective ? Perform Wilcoxon Matched pairs signed difference rank test at 5 % level of significance.

13. Two sample are drawn from two normal population :

Sample 1	:	20	16	26	27	23	22	18	24	25	19	
Sample 2	:	27	33	42	35	32	34	38	28	41	43	30	37

Test using variance ratio 5 percent and 1 percent level of significance whether the two populations have the same variance

14. Discuss the general procedure for hypothesis testing ?

$(2 \times 15 = 30 \text{ marks})$

D 13082 (Pages : 3) Name......................................

Reg. No................................

FIRST SEMESTER M.Com. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

[November 2020 session for SDE/Private students]

(CBCSS)

M.Com.

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admission onwards)

{Covid instructions are not applicable for Pvt/SDE students (November 2020 session)}

Time : Three Hours Maximum : 30 Weightage

General Instructions

1. *In cases where choices are provided, students can attend* **all** *questions in each section.*

2. *The minimum number of questions to be attended from the Section / Part shall remain the same.*

3. *The instruction if any, to attend a minimum number of questions from each sub section / sub part / sub division may be ignored.*

4. *There will be an overall ceiling for each Section / Part that is equivalent to the maximum weightage of the Section / Part.*

Part A

Answer any **four** *questions.*
Each question carries 2 weightage.

1. What is confidence interval ?

2. Define Hypothesis.

3. What is non-parametric test ?

4. What is partial Correlation ?

5. What is point estimation ?

6. Define Chi-square.

7. Briefly explain the uses of MS Excel in quantitative methods.

(4 × 2 = 8 weightage)

Turn over

Part B

Answer any **four** *questions.*

Each question carries 3 *weightage.*

8. If the probability of defective bolts is 0.1, find the mean and standard deviation for the distribution of defective bolts in a total of 500.

9. On an average 1 house in 1,000 in a certain district has a fire during a year. If there are 2,000 houses in that district, what is the probability that exactly five houses will have a fire during the year ?

10. A person throws 10 dice 500 times and obtains 2560 times 4, 5 or 6. Can this be attributed to fluctuations of sampling ?

11. Two samples of 100 electric bulbs each has a means 1500 and 1550, standard deviations 50 and 60. Can it be concluded that two brands differ significantly at 1 % level of significance in equality.

12. In a sample of 8 observations, the sum of squared deviations of items from the mean was 84.4. In another sample of 10 observations, the value was found to be 102.6. Test whether the difference is significant at 5 % level.

   You are given that at 5 % level of significance, critical value of F for $n = 7$ and $v_2 = 9$ degrees of freedom is 3.29 and for $v_1 = 8$ and $v_2 = 10$ degrees of freedom, its value is 3.07.

13. In an anti-malarial campaign in a certain area, quinine was administered to 812 persons out of a total population of 3248. The number of fever cases is shown below :

Treatment		Fever	No fever	Total
Quinine	...	20	792	812
No quinine	...	220	2216	2436
Total	...	240	3008	3248

Discuss the usefulness of quinine in checking malaria.

14. Given $\sum dx = 0$; $\sum dx^2 = 776$; $\sum dy = 0$; $\sum dy^2 = 550$; and $\sum dxdy = 280$; $n = 5$.

    Calculate Karl Pearson's co-efficient of correlation.

    $(4 \times 3 = 12$ weightage)

Part C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. The following data show the number of seeds germinating out of 5 lb damp filter for 80 sets of seeds. Fit a binomial distribution of this data and find the expected frequencies.

X	:	0	1	2	3	4	5
Y	:	6	20	28	12	8	6

16. The demand for a particular spare part in a factory was found to vary from day to day. In a sample study, the following information was obtained :

Days	:	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
No. Parts demanded	:	1.124	1.125	1.110	1.120	1.126	1.115

    Test the hypothesis that the number of parts demanded does not depend on the day of the week. (The table value of Chi-square for 5 d.f. and 5% level of significance is 11.07).

17. For 17 observations on price (x) and supply (y), the following data were obtained in appropriate units. $\sum x = 544$; $\sum x^2 = 19040$; $\sum y = 244$; $\sum y^2 = 3773$; $\sum xy = 8413$, obtain the two regression lines. What is the supply when price is Rs. 35 ?

18. Explain the Properties of Normal Distribution.

    $(2 \times 5 = 10$ weightage)

D 14382   (Pages : 3 + 4 = 7)   Name......................................

Reg. No................................

FIRST SEMESTER M.Com. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2021

(CBCSS—SDE/Private)

M.Com.

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admission onwards)

Time : Three Hours   Maximum : 30 Weightage

SECTION A

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. Define Poisson Distribution.

2. What is interval estimation ?

3. What is Type I Error ?

4. What is parametric test ?

5. What is multiple Correlations ?

6. What one-tailed test ?

7. Briefly explain the uses of SPSS in quantitative techniques.

(4 × 2 = 8 weightage)

SECTION B

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. The incidence of a certain disease is such that on the average 20% of workers suffer from it. If 10 workers are selected at random, find the probability that : (i) exactly two workers suffer from disease ; (ii) not more than 2 workers suffer from the disease.

9. Suppose that a manufactured product has 2 defects per unit of product inspected. Using Poisson distribution, calculate the probabilities of finding a product without any defect, 3 defects and 4 defects, (given $e^{-2} = 0.135$).

Turn over

10. The following data give frequencies of occurrences of variable x between certain limits :

Variable (x)	Frequency (f)
Less than 40	30
40 or more but less than 50	33
50 and above	37
Total	100

The distribution is exactly normal. Find the average and standard deviation of x.

11. Two samples of 6 and 5 items respectively gave the following data :

Mean on 1st sample   40

S.D of 1st sample   8

Mean on 2nd sample   50

S.D of 2nd sample   10

Is the difference of means significant ? The value of t for 9 degrees of freedom at 5% level is 2.26.

12. The following is an arrangement of 25 men (M) and 15 women (W) lines up to purchase tickets for a show :

M   WW   MMM   W   MM   W   M   W   M   WWW

MMM   W   MM   WWW   MMMMMM WWW   MMMMMM

Test for randomness at the 5 percent level of significance

13. From the following data obtain the two regression equations :

X   :   6   2   10   4   8

Y   :   9   11   5   8   7

14. Total of the product of deviations of X and Y series = 3044

Number of pairs of observations = 10

Total of the deviations of X series = –170

Total of the deviations of Y series = –20

Total of the squares of deviations of X series = 8288

Total of the squares of deviations of Y series = 2264

Find out the co-efficient of correlation when the assumed means of X series and Y series are 82 and 68 respectively.

$(4 \times 3 = 12$ weightage$)$

SECTION C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. A systematic sample of 100 pages was taken from a dictionary and obtained frequency distribution of foreign words per page was found to be as follows. Calculate the expected frequencies using Poisson distribution. Also compute variance of the fitted distribution :

Number of foreign words per page (x) :	0	1	2	3	4	5	6
Frequency :	48	27	12	7	4	1	1

16. For a random sample of 10 persons, fed on diet A, the increased weight in pounds in a certain period were :

    10, 6, 16, 17, 13, 12, 8, 14, 15, 9.

    For another random sample of 12 persons, fed on diet B the increase in the same period wee

    7, 13, 22, 15, 12, 14, 18, 8, 21, 23, 10, 17.

    Test whether the dies A and B differ significantly as regards their effect on increased weight :

Degrees of freedom :	19	20	21	22	23
Value of t at 5% level :	2.09	2.09	2.08	2.07	2.07

17. From the following results, estimate the yield of crops when the rainfall is 22cms and the yield is 600kgs.

	Yield in Kg (Y)	Rainfall in cms (X)
Mean	508.4	26.7
SD	36.8	4.6

Co-efficient of correlation between yield and rainfall is 0.52

18. What is normal distribution ? What are its properties ?

(2 × 5 = 10 weightage)

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FIRST SEMESTER M.Com. DEGREE (CBCSS) REGULAR/SUPPLEMENTARY EXAMINATION, NOVEMBER 2022

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admission onwards)

Time : Three Hours　　　　　　　　　　　　　　　　　Maximum Weightage : 30

Part A

Answer any **four** *questions.*
Each question carries a weightage 2.

1. Define binomial distribution.

2. What is statistical estimation ?

3. What is Type II Error ?

4. What is ANOVA ?

5. What is coefficient of determination ?

6. What is degree of freedom ?

7. Briefly explain the uses of MS Excel in quantitative methods.

$(4 \times 2 = 8$ weightage)

Part B

Answer any **four** *questions.*
Each question carries a weightage 3.

8. The ranking of 10 students in two subjects A and B are as follows :

　A : 6　5　3　10　2　4　9　7　8　1
　B : 3　8　4　9　1　6　10　7　5　2

Calculate rank correlation coefficient.

9. The equations of two lines of regression obtained in a correlation analysis are the following :

$2x = 8 - 3y$ and $2y = 5 - x$.

Obtain the value of the correlation coefficient.

10. A coin is tossed six times. What is the probability of obtaining four or more heads ?

Turn over

11. The income distribution of workers in a certain factory was found to be normal with mean =Rs. 1,000 and *sd*=Rs. 100. There were 180 persons getting above Rs. 1,200. How many persons were there all ?

12. In a simple random sample of 600 men taken from a big city, 400 are found to be smokers. In another simple random sample of 900 men taken from another city 450 are smokers. Do the data indicate that there is a significant difference in the smoking habits in the two cities ?

13. A random sample of size 16 has 53 as mean. The sum of the squares of the deviations taken from mean is 135. Can this sample be regarded as taken from the population having 56 as mean ? Obtain 95 % confidence limits (for $v = 15$, $t_{0.05} = 2.13$).

14. Total of the product of deviations of X and Y series = 3044

Number of pairs of observations = 10

Total of the deviations of X series = – 170

Total of the deviations of Y series = – 20

Total of the squares of deviations of X series = 8288.

Total of the squares of deviations of Y series = 2264

Find out the coefficient of correlation when the assumed means of X series and Y series are 82 and 68 respectively.

$(4 \times 3 = 12$ weightage$)$

Part C

Answer any **two** *questions.*
Each question carries a weightage 5.

15. In a certain examination the percentage of passes and distinctions where 46 and 9 respectively. Estimate the average marks obtained by the candidates, the minimum pass and distinction marks being 40 and 75 respectively. (assume the distribution of marks to be normal).

Also determine what would have been the minimum qualifying marks for admission to a re-examination of the failed candidates had it been decided that the 25 % of them should be given another opportunity of being examined.

16. Suppose you are working as a purchase manager for a company. The following information has been supplied to you by two manufactures of electric bulb :

		Company A	Company B
Mean life (in hours)	…	1300	1248
Standard deviation (in hours)	…	82	83
Sample size	…	100	100

Which brand are you going to purchase if you desire to take a risk to 5 % ?

17. From the following data, obtain the two regression equations :

Sales	91	97	108	121	67	124	51	73	111	57
Purchase :	71	75	69	97	70	91	39	61	80	47

18. What is normal distribution ? What are its properties ?

$(2 \times 5 = 10$ weightage$)$

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FIRST SEMESTER M.Com. (CBCSS) [REGULAR/SUPPLEMENTARY] DEGREE EXAMINATION, NOVEMBER 2023

Master of Commerce

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admisson onwards)

Time : Three Hours　　　　　　　　　　　　　　　　Maximum Weightage : 30

Section A

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. Explain the role of quantitative techniques in decision making.

2. State the concept of (a) Pont estimation (b) Interval estimation.

3. What is F Test ? List out some of its applications.

4. Distinguish between Regression and Correlation.

5. Bring out the important properties of Poisson distribution.

6. Define hypothesis. Briefly explan different types of hypotheses.

7. Discuss the use of Excel in data analysis.

　　　　　　　　　　　　　　　　　　　　　　　　(4 × 2 = 8 weightage)

Section B

Answer any **four** *questions.*
Each question carries 3 *weightage.*

8. Briefly explain the limitatons of quantitative techniques.

9. Write note on (a) One sample test and (b) Two sample tests.

10. The weekly wages of 1000 workmen are normally distributed around a mean of Rs. 70 and Standard deviation of Rs. 5. Estimate the number of workers whose weekly wages will be (a) between Rs. 69 and Rs. 72 ; (b) More than Rs. 75 ; (c) Less than Rs. 63.

11. A survey was conducted to study the relationship between expenditure on accommodation (*x*) and expenditure on food (*y*) and the following results were obtained :

		Mean	*Standard Deviation*
Expenditure on Accommodation (Rs.)	...	173	63.15
Expenditure on Food (Rs.)	...	47.86	22.98
Co-efficient of correlation = + 0.57			

Write down the regression equation and estimate the expenditure on food when the expenditure on accommodation is Rs. 200.

　　　　　　　　　　　　　　　　　　　　　　　　Turn over

12. Following table use the yield of 15 sample plots and 3 varieties of seeds :

A	B	C
20	18	25
21	20	28
23	17	22
16	15	28
20	25	32

Test whether the average yield of land and the varieties of seeds differ significantly.

13. In a referendum submitted to the 'student body' at a university, 850 men and 550 women voted. 530 of the men and 310 of the women voted 'yes'. Does this indicate a significant difference of the opinion on the matter between men and women students ?

14. A factory is producing 50000 pairs of shoes daily. From a sample of 500 pairs, 2 % are found to be of substandard quality. Estimate the number of pairs that can be reasonably expected to be spoiled in the daily production and assign limits at 95 % level of confidence.

$(4 \times 3 = 12$ weightage$)$

Section C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. The recruits were subjected to selection test to ascertan their suitability for a certain course of training. At the end of the training, they were given proficiency test. The marks secured by the recruits are recorded below :

Selection Test Score (X)　:　65　66　67　68　69　70　71　67

Proficiency Test Score (Y) :　67　68　64　72　70　67　70　68

Calculate co-efficient of correlation and comment on the result.

16. Based on informatoin on 1000 randomly selected fields, about the tendency status of the cultivation of these field and use of fertilizers, collected in Agro economic survey, the following classification was noted :

		Owned	*Rented*	*Total*
Using fertilizers	…	416	184	600
Not using fertilizers	…	64	336	400
Total	…	480	520	1000

Would you conclude that owner cultivators are more inclined towards the use of fertilzers at 5 % level. Use Chi square.

17. Two samples are drawn from two normal population. From the following data test whether two samples have the same variance at 5 % level :

Sample 1 :　60　65　71　74　76　82　85　87

Sample 2 :　61　66　67　85　78　63　85　86　88　91

18. Explain the different tools for analysis, available in SPSS.

$(2 \times 5 = 10$ weightage$)$

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FIRST SEMESTER M.Com. DEGREE (REGULAR/SUPPLEMENTARY) EXAMINATION, NOVEMBER 2024

(CBCSS)

M.Com.

MCM 1C 03—QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

(2019 Admission onwards)

Time : Three Hours Maximum : 30 Weightage

Answers should be written in English only.

Section A

Answer any **four** *questions.*
Each question carries 2 *weightage.*

1. State the different techniques of analysis of variance.

2. Distinguish between discrete and continuous probability distribution.

3. Briefly explain the scope of quantitative techniques.

4. What do you mean by sign test ? State its assumptions.

5. List out the advantages and disadvantages of SPSS in data analysis.

6. What are non-parametric tests. State some of its types.

7. Write note on :

    (a) Null hypotheses ; and

    (b) Alternate hypotheses.

(4 × 2 = 8 weightage)

Turn over

Section B

Answer any **four** *questions.*
Each question carries 3 weightage.

8. Define Correlation. Explain the different types of correlation.

9. A box contains 100 transistors, 20 of which are defective. 10 are selected for inspection. Indicate what is the probability that :

   (a)   All the 10 are defective ;

   (b)   Atleast one is defective ; and

   (c)   At the most 3 are defective.

10. What is Normal Distribution. What are its properties.

11. A machine produces a component of a product with a standard deviation of 1.6 cm in length. A random sample of 64 components was selected from the output and this sample has a mean length of 90 cm. The customer will reject the part if it is either less than 88 cm or more than 92 cm. Can we conclude that the product produced by the machine will be accepted by the customers.

    Test at 95 % confidence level.

12. Four coins were tossed 160 times and the following results were obtained :

No. of heads	:	0	1	2	3	4
Observed Frequencies	:	17	52	54	31	6

    Under the assumption that coins are balanced, find the expected frequencies of getting 0, 1, 2, 3 and 4 heads and test the goodness of fit.

13. Find out spearman's co-efficient of correlation between the two kinds of assessment of graduate students' performance in a college :

Name of students	:	A	B	C	D	E	F	G	H	I
Internal Exam	:	51	68	73	46	50	65	47	38	60
External Exam	:	49	72	74	44	58	66	50	30	35

14. 1000 articles from a factory were examined and found to be 3 % defective. Among 1500 similar articles from a second factory, 2 % are found to be defective. Can it be reasonably concluded that the product of the first factory is inferior to second ?

    $(4 \times 3 = 12$ weightage$)$

Section C

Answer any **two** *questions.*
Each question carries 5 *weightage.*

15. Set up an ANOVA table and also state whether variety differences are significant at 5 % level

Per Acre Production data of Wheat

Varieties of fertilisers	Varieties of seeds		
	A	B	C
W	6	5	5
X	7	5	4
Y	3	3	3
Z	8	7	4

16. The following data gives the age and blood pressure (BP) of 10 sports persons :

Name	:	A	B	C	D	E	F	G	H	I	J
Age (X)	:	42	36	55	58	35	65	60	50	48	51
BP (Y)	:	98	93	110	85	105	108	82	102	118	99

   (a) Find regression equations of Y on X and X on Y ; and

   (b) Estimate the blood pressure of a sports person whose age is 45.

17. Given below is a contingency table for production in three shifts and the number of defective good that turn out. Is it possible that the number of defective goods depend on the shifts run by them ?

Number of shifts

Shifts	I Week	II Week	III Week	Total
I	15	5	20	40
II	20	10	20	50
III	25	15	20	60
	60	30	60	150

18. Explain the different tools available in Excel, for data analysis.

(2 × 5 = 10 weightage)