C 21202 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2022

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2017—2018 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer all **ten** *questions .*
Each question carries 1 *mark.*

I. Choose the Correct Answer :

1 The statistical technique of determining numerical values of the likely hood of the occurrence of events the :

(a) Interpolation. (b) Statistical quality control.

(c) Probability. (d) Hypothesis testing.

2. The numerical value to express the extent of relationship exists between two or more variables :

(a) Co-efficient of variance. (b) Regression co-efficient.

(c) Correlation Co-efficient. (d) Standard error.

3. Any possible outcome of a random experiment is called :

(a) An event. (b) Random Error.

(c) null set. (d) Mutually exclusive events.

4. Which is not the Property of Normal Distribution or Normal Curve ?

(a) Continuous distribution.

(b) Symmetrical about the mean.

(c) Variance = npq.

(d) Quantities are equi-distant from median.

Turn over

5. Type I Error is :

   (a) Rejecting a null hypothesis when it is false.

   (b) Accepting a null hypothesis when it is true.

   (c) Rejecting a null hypothesis when it is true.

   (d) Accepting a null hypothesis when it is false.

Fill in the Blanks :

6. ——————— measures asymmetry of a distribution.

7. ——————— is used to estimate the value of one variable for a given value of another.

8. Two events are said to be ——————— if the occurrence of one of them excludes the possibility of the occurrence of the other in a single observation.

9. The Variance of Poisson distribution is ———————.

10. The statistical tests based on the assumption that population or population parameter is normally distributed are called ———————.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions from the following.*
Each question carries 2 *marks.*

11. What are the Limitations of Quantitative Techniques

12. What is correlation analysis ?

13. Which are the different Degrees of correlation ?

14. What are the regression lines ?

15. Distinguish between Simple and Compound Events.

16. What is Classical Approach to Probability ?

17. Which are the properties of binomial distribution ?

18. What is the range of Normal Curve ?

19. Which are the assumptions in t-test ?

20. What are the Assumptions of F-distribution ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions from the following.*
Each question carries 4 *marks.*

21. Which are the popular mathematical quantitative techniques ?

22. Which are the graphic methods of measuring correlation ?

23. Calculate Karl Pearson's co-efficient of correlation from the following information and comment on the result : Standard deviation of X series 10, Standard deviation of Y series 12, Arithmetic mean of X series 25, Arithmetic mean of Y series 35, Summation of product of deviations from actual arithmetic means of two series 24, Number of observations

24. Tickets are numbered from 1 to 100. They are well shuffled and a ticket is drawn at random. what is the probability that the drawn ticket has : (a) an even number, (b) a number 5 or a multiple of 5, (c) a number which is greater than 75, (d) a number which is a square ?

25. A university has to select an examiner from a list of 50 persons, 20 of them women and 30 men, 10 of them knowing Hindi and 40 not. 15 of them being teachers and the remaining 35 not. What is the probability of the University selecting a Hindi-knowing women teacher ?.

26. Four coins are tossed simultaneously. What is the probability of getting (a) 2 heads and 2 tails (b) at least two heads (c) at least one head.

27. Which are the Practical situations where Poisson Distribution can be used ?

28. Explain the Uses of F-distribution.

(6 × 4 = 24 marks)

Part D

Answer any **two** *questions from the following.*
Each question carries 15 *marks.*

29. Find correlation between marks obtained by 10 students in mathematics and statistics :

X	:	2	4	6	6	8	9	10	4	7	4
Y	:	12	12	16	15	18	19	19	14	15	10

30. Fit a normal distribution of the following data :

Marks	:	10–20	20–30	30–40	40–50	50–60	60–70	70–80
No. of students	:	4	22	48	66	40	16	4

Turn over

31. The following table gives data regarding election to an office :

Attitude towards election	Economic Status		
	Rich	Poor	Total
Favourable	50	155	205
Non-favourable	90	110	200
Total	140	265	405

Is attitude towards election influenced by economic status of workers.

(2 × 15 = 30 marks)

C 21201 **(Pages : 4)** **Name.....**

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2022

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2014—2016 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer all **ten** *questions.*
Each question carries 1 *mark.*

I. Choose the correct answer :

1 Analysis of co-variation of two or more variables is usually called :

(a) Skewness. (b) Dispersion.

(c) Central tendency. (d) Correlation.

2 X^2 value ranges ————————.

(a) From zero to infinity. (b) From – 1 to +1.

(c) From 0 to – 1. (d) From 0 to +1.

3 When the variables are varying in the same direction, it is called ————————.

(a) Linear correlation. (b) Simple correlation.

(c) Negative correlation. (d) Positive correlation.

4 An event whose occurrence is inevitable is called :

(a) Dependent event. (b) Independent event.

(c) Uncertain event. (d) Sure event.

5 Which is not a parametric test ?

(a) Z-test. (b) T-test.

(c) F-test. (d) Chi-square test.

Turn over

II. Fill in the Blanks :

6 ———— is a numerical value to express the extent of relationship exists between two or more variables.

7 ———— is a type of regression which uses one independent variable to explain and or predict the dependent variable.

8 ———— is a distribution obtained for a random variable on the basis of a mathematical model.

9 ———— is the probability distribution expressing the probability of one set of dichotomous alternatives.

10 ———— is an assumption made about a population parameter.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions from the following.*
Each question carries 2 *marks.*

11 What are quantitative techniques ?

12 List the limitations of quantitative techniques.

13 What is meant by perfect positive correlation ?

14 What are the features of regression coefficients ?

15 Which are the methods of describing a set ?

16 Distinguish between equally likely events and mutually exclusive events.

17 What are the properties of probability distributions ?

18 What are the assumptions of binomial distribution ?

19 What are the uses of standard error ?

20 Which are the assumptions of Z-test ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions from the following.*
Each question carries 4 *marks.*

21 Which are the mathematical techniques used in business decision-making ?

22 Give the significance of correlation analysis.

23 Given :

$N = 5 \quad \bar{X} = 20 \quad \bar{Y} = 10$

$\sum (X - 20)^2 = 100 \qquad \sum (Y - 10)^2 = 60$

$\sum (X - 20)(Y - 10) = 40.$

Find two regression equations.

24 Two unbiased dice are thrown. Find the probability that : (a) Both the dice show the same number ; (b) One die shows 6 ; (c) First die shows 3 ; (d) Total of the numbers on the dice is 9 ; (e) Total of the numbers on the dice is greater than 8 ; and (f) A sum of 11.

25 The probability that Sachin Tendulkar scores a century in a cricket match is $\frac{1}{3}$. What is the probability that out of 5 matches, he may score century in :

(1) Exactly 2 matches.

(2) No match.

26 For a binomial distribution, Mean is 6 and Standard Deviation is $\sqrt{2}$. Find the parameters.

27 State the procedure for testing of hypothesis.

28 What are the uses of Z-test ?

(6 × 4 = 24 marks)

Part D

Answer any **two** *questions from the following.*
Each question carries 15 *marks.*

29 Calculate coefficient of correlation from following data :

X	...	0	5	15	14	10	12	10	8	16	15
Y	...	20	5	12	10	8	5	6-	15	12	18

30 Explain the various theorems of probability.

31 Two random sample were drawn from two normal populations and their values are :

A	:	66	67	75	76	82	84	88	90	92	
B	:	64	66	74	78	82	85	87	92	93	95	97

Test whether population standard deviations are equal.

(2 × 15 = 30 marks)

C 2104 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
APRIL 2021

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2017 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

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

Choose the correct answer :

1. Binomial distribution is developed by ————————.
   a) James Bournoully.
   b) Jakob Bernoully.
   c) James Bernoully.
   d) None of these.
2. Poisson distribution is applicable to ————————.
   a) Rare events.
   b) Continuous distribution.
   c) Events having two outcomes.
   d) Unexpected events.
3. Base theorem is based on ————————.
   a) Addition theory.
   b) Multiplication theory.
   c) Inverse probability.
   d) None of these.
4. The mean of Poisson distribution is ————————.
   a) P.
   b) O.
   c) np.
   d) Positive part.
5. Conditional probability is represented by ————————.
   a) A/B.
   b) B/A.
   c) C/D.
   d) All of these.

Turn over

Fill in the blanks :

6. When the amount of change in one variable leads to constant change in other variable, correlation is ————————.
7. Regression analysis is one of the very scientific techniques for making ————————.
8. A set events is said to be mutually exclusive if ————————.
9. SD of binomial distribution ————————.
10. Most discrete probability distributions tend to normal distribution as ————————.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What is meant by exhaustive events ? Give example.
12. Describe the term "correlation co-efficient".
13. State basic properties of normal distribution.
14. What is SE ?
15. Describe the 'law of statistical regularity'.
16. Explain briefly conditional probability.
17. What is meant by Central Limit theorem ?
18. What is critical region ?
19. Describe F test.
20. What is meant by 'ANOVA' ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

21. Explain properties of binomial distribution.
22. Describe the concept 'hypothesis' and its types.
23. What is meant by tailed tests ? Describe in detail its types.

24. What are the uses of Chi-square test ?

25. Find the correlation co-efficient if $\sum xy = 203, \sum x^2 = 400, \sum y^2 = 190$.

26. Find b_{yx} if $2x + 4y - 5 = 0$ is equation of y on x.

27. What is the probability of selecting a boy from a class containing 4 boys and 3 girls.

28. The probability that a batsman scoring a century in a cricket matches is $\frac{1}{3}$. What is the probability that out of 5 matches, he may score century in : a) Exactly 2 matches ; b) no matches.

(6 × 4 = 24 marks)

Part D

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

29. In a town 10 accidents took place in a span of 50 days. Assuming that the number of accidents per day follows the Poisson distribution, find the probability that there will be three or more accidents in a day.

30. In a continuous random variate which is normal with mean 485 and standard deviation 33. Calculate the percentage of items between, a) 450 and 485 ; b) 450 and 500 ; c) less than 45 ; d) 500 and 531 ; and e) more than 531.

31. From the following data use Chi-square test and calculate whether innoculation is effective in preventing tuberculosis :

		Attacked	Not attacked
Inoculated	...	31	469
Non-inoculated	...	185	1315

(2 × 15 = 30 marks)

C 80792 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER B.Com./B.B.A. DEGREE EXAMINATION, APRIL 2020

(CUCBCSS—UG)

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2017 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*

Each question carries 1 *mark.*

Choose the correct answer :

1. Binomial distribution has ———— (number of) parameters.

   (A) Three. (B) Two.

   (C) One. (D) Four.

   (E) None.

2. Each trial in Binomial distribution has :

   (A) One Outcome. (B) Two Outcome.

   (C) Three Outcome. (D) Four Outcome.

3. The mean of binomial distribution is :

   (A) npq. (B) np.

   (C) $\sqrt{npq}$. (D) $\sqrt{np}$.

   (E) $\sqrt{nq}$.

4. Which of the following mentioned standard probability density functions is applicable to discrete Random Variables ?

   (A) Gaussian Distribution. (B) Poisson Distribution.

   (C) Rayleigh Distribution. (D) Exponential Distribution.

Turn over

5. Mutually Exclusive events :

   (A) Contain all sample points.

   (B) Contain all common sample points.

   (C) Does not contain any sample point.

   (D) Does not contain any common sample point.

Fill in the blanks :

6. A table with all possible value of a random variable and its corresponding probabilities is called ————————.

7. Previous probabilities in Bayes Theorem that are changed with help of new available information are classified as ————————.

8. The weight of persons in a state is a ———————— variable.

9. In a Binomial Distribution, if p, q and n are probability of success, failure and number of trials respectively then variance is given by ————————.

10. It is suitable to use Binomial Distribution only for ———————— values of 'n'.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What is quantitative technique ?

12. Define Karl Pearson's co-efficient of correlation.

13. Briefly explain multiplication theorem of probability.

14. What is Baye's Theorem ?

15. Define Poisson distribution.

16. What is a standard normal curve ?

17. What is statistical inference ?

18. What is one tailed test ?

19. Define z-test.

20. What is standard error ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

21. What are the properties of normal distribution ?

22. Explain the concept of non-parametric test.

23. What are the errors in hypothesis testing ?

24. 2 fair 6-sided dice are rolled. What is the probability that the sum of these dice is 10 ?

25. Bring out the fallacy in the following "The mean of a Binomial distribution is 5 and SD is 3".

26. It is known from past experience that in a certain plant there are on average 4 industrial accidents per month. Find the probability that in a given year there will be less than 3 accidents. Assume Poisson distribution.

27. The per acre yield of crop in a particular area is observed to follow a normal distribution with mean 15 quintals and S.D. of 5 quintals. Find the proportion of the area yielding at least 25 quintals.

28. Prove that the sum of the probabilities of all possibilities in two independent events amounts to certainty.

(6 × 4 = 24 marks)

Part D

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

29. Calculate Spearman's co-efficient of correlation between the marks assigned to ten students by Judges X and Y in a certain competitive test as shown :

S. No.	:	1	2	3	4	5	6	7	8	9	10
Marks by Judge X	:	52	53	42	60	45	41	37	38	25	27
Marks by Judge Y	:	65	68	43	38	77	48	35	30	25	50

30. Twelve dice were thrown 4096 times. Each 4, 5 or 6 spot appearing was considered to a success, while a 1, 2 or 3 spot was a failure. Calculate the theoretical frequencies for 0, 1, 2, ... 12 successes.

31. A stenographer claims that she can take dictations at the rate of more than 120 words per minute. Of the 12 tests given to her she could perform an average of 135 words with a standard deviation of 40. Is her claim valid ? (α = 0.01).

(2 × 15 = 30 marks)

C 80791

(Pages : 4)

Name.....

Reg. No.....

FOURTH SEMESTER B.Com./B.B.A. DEGREE EXAMINATION
APRIL 2020

(CUCBCSS—UG)

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

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

1. Normal distribution was developed by ———.

   (a) De-Moivre.
   (b) Karl Pearson.
   (c) James Bernoulli.
   (d) Saimon Dennis.

2. Mean, Median and Mode are equal in ——— distribution.

   (a) Binomial.
   (b) Poisson.
   (c) Normal.
   (d) All the above.

3. From the following which is non-parametric test :

   (a) Chi-square test.
   (b) Sign test.
   (c) Run test.
   (d) All the above.

4. What is the probability of getting 3 white balls in a draw of 3 balls from a box containing 6 white and 5 red balls :

   (a) 2/33.
   (b) 4/33.
   (c) 100/990.
   (d) 150/990.

5. ——— is the statistical measure which measures reliability and dependability of the value of co-efficient of correlation.

6. Number of different arrangements that can be made by taking some or all the items are called ——— of those items.

7. ——— is the subset of the sample space of a random experiment.

8. If P (A) = 0.5, P (B) = 0.7, P $(A \cap B)$ = 0.3, Then, P $(A \cup B)$ = ———.

9. A random variable which assumes specified values in a given interval is known as ———.

10. Statistical test applied to test the equality of variances of two population is ———.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions.*
Each question carries 2 marks.

11. What is Regression Analysis ?

12. What is Random experiment ?

13. What do you mean by co-efficient of correlation ?

14. How many ways a cricket team containing 11 players can be formed from 15 high-class players available ?

15. Write down the Law of statistical regularity.

16. What is Critical Region ?

17. What are Type I and Type II errors ?

18. Point out the assumptions of *t*-test.

19. What is a contingency table ?

20. Write down the Multiplication theorem of Probability.

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions.*
Each question carries 4 marks.

21. Explain the uses of X^2 test.

22. Explain the functions of Quantitative Techniques.

23. Differentiate between Correlation and Regression.

24. Define Binomial distribution. Explain the situations in Binomial distribution can be applied.

25. Rahul is selected for an interview for 3 posts. For the first post, there are 5 candidates, for the second there are 4 and for the third there are 6. If the selection of each candidate is equally likely, find the chance that Rahul will be selected for atleast one post.

26. Assume the mean height of soldiers to be 68.82 inches with a variance of 10.8 inches. How many soldiers in a regiment of 1,000 would you expect to be over six feet tall ?

27. In a random sample of 2,000 farmers selected from the state of Punjab in the year 2005, 50 % farmers stated that the level of rainfall during the paddy season was satisfactory. In the year 2010, 60 % out of a random sample of 2,500 farmers observed the same for that year. Using .01 level of significance, test the hypothesis whether the average level of rainfall during the paddy season in Punjab was the same in both the years.

28. Calculate co-efficient of correlation from the following :

Case	:	1	2	3	4	5	6	7	8
X1	:	10	6	9	10	12	13	11	9
X2	:	9	4	6	9	11	13	8	4

(6 × 4 = 24 marks)

Part D

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

29. Define Quantitative Techniques. What are the different methods of Quantitative Techniques ? Also, explain the role of quantitative techniques in Business and Industry.

30. The heights in cm. of a group of fathers and sons are given below :

Height of father :	158	160	163	165	167	170	172	175	177	181
Height of son :	163	158	167	170	160	180	170	175	172	175

Find the lines of Regression and estimate the height of the son when the height of father is 164 cm.

31. One fifth percentage of the blades produced by a blade manufacturing factory turn out to be defective. The blades are supplied in packets of 10. Use Poisson distribution to calculate the approximate number of packets containing no defective, one defective and two defectives respectively in a consignment of 1,00,000 packs.

(2 × 15 = 30 marks)

C 61160 (Pages : 3) Name..............................

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

FOURTH SEMESTER B.Com./B.B.A. DEGREE EXAMINATION, APRIL 2019

(CUCBCSS—UG)

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2014 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

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

1. Estimation of the unknown value of one variable from the known value of other variable is known as ————.

   (a) Correlation. (b) Regression.

   (c) Probability. (d) Bayes Theorem.

2. If the happening of one event affects the happening of the other, the events are said to be ————.

   (a) Dependent. (b) Independent.

   (c) Mutually Exclusive. (d) Equally likely events.

3. Parameter of Poisson distribution is ————.

   (a) m. (b) n, p.

   (c) σ. (d) n, p, q.

4. Type 1 error means :

   (a) Accepting null hypothesis when it is true.

   (b) Accepting null hypothesis when it is false.

   (c) Rejecting null hypothesis when it is false.

   (d) Rejecting null hypothesis when it is true.

5. The probability of getting a king card from a pack of playing cards is ————.

   (a) 1/52. (b) 4/52.

   (c) 13/52. (d) 8/52.

Turn over

Fill in the blanks :

6. If A and B are two mutually exclusive events, then $P(A \cup B)$ = ————.
7. When the correlation co-efficient is 1, there is ———— correlation.
8. The height of the normal curve is maximum at ————.
9. Statistical test applied in Analysis of variance is ————.
10. Poisson distribution was developed by ————.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What do you mean by Quantitative Techniques ?
12. Point out the methods for studying correlation.
13. Define Probability.
14. Write down the Classical definition of Probability.
15. What is Standard Normal Curve ?
16. What is Statistical Inference ?
17. What is Standard Error ?
18. Define x2.
19. What are the different types of variances in the two-way classification of data ?
20. What is Permutation ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

21. Explain the application of Quantitative Techniques in Business and Industry.
22. Explain the properties of Normal curve.
23. Describe the importance of Poisson Distribution.
24. Explain Baye's theorem with example.
25. Find Karl Pearson's co-efficient of correlation and Probable error :

Year	:	2011	2012	2013	2014	2015	2016	2017	2018
Imports	:	46	68	72	75	80	70	93	100
Exports	:	64	50	39	48	52	46	40	30

26. Forty lottery tickets numbered 1, 2, 3..... are put in a bag. Two Draws of 1 ticket each are made. The ticket after the first draw is replaced. What is the probability that in the first draw it is a multiple of 4 or 5 and in the second it is a multiple of 5 or 7 ?

27. From the production process which turns 5% defective on an average, a sample of size 10 is drawn. Find the probability that the sample contains i) no defective ; ii) at most one defective ; iii) atleast one defective.

28. A fertilizer mixing machine is set to give 12 kg of nitrate for every quintal bag of fertilizer. Ten 100 kg bags are examined. The percentage of nitrates is as follows. 11, 14, 13, 12, 13, 12, 13, 14, 11, 12. Is there reason to believe that the machine is defective ?

(6 × 4 = 24 marks)

Part D

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

29. 1000 students are randomly selected from 10000 students enrolled in a PG programme were classified by age and grade point :

Grade point	Age in years			
	21 and under	22-24	25-27	Over 27
Up to 3.0	320	80	10	200
3.1–3.5	50	15	70	60
3.6–4.0	30	5	20	40

At 5% level of significance test the hypothesis that age and grade points are independent.

30. From the data given below find :

(a) Two regression equations.

(b) Co-efficient of correlation between the marks in Economics and Statistics.

(c) The most likely marks in Statistics when mark in Economics is 30.

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

31. What is Statistical Tests ? Explain the procedure for testing of Hypothesis.

(2 × 15 = 30 marks)

C 61161 (Pages : 3)

Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE EXAMINATION, APRIL 2019

(CUCBCSS—UG)

B.Com.

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS.

(2017 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*

Each question carries 1 *mark.*

Choose the correct answer :

1. What are the chances that no two boys are sitting together for a photograph if there are 5 girls and 2 boys ?

   (a) 1/21. (b) 4/7.

   (c) 2/7. (d) 5/7.

2. What is probability of drawing two clubs from a well shuffled pack of 52 cards ?

   (a) 13/51. (b) 1/17.

   (c) 1/26. (d) 13/17.

3. When two coins are tossed simultaneously, what are the chances of getting at least one tail ?

   (a) 3/4. (b) 1/5.

   (c) 4/5. (d) 1/4.

4. What is the possibility of having 53 Thursdays in a non-leap year ?

   (a) 6/7. (b) 1/7.

   (c) 1/365. (d) 53/365.

5. In a drawer there are 4 white socks, 3 blue socks and 5 grey socks. Two socks are picked randomly. What is the possibility that both the socks are of same color ?

   (a) 4/11. (b) 1.

   (c) 2/33. (d) 19/66.

Turn over

Fill in the blanks :

6. Two dice are thrown simultaneously. The probability of getting two numbers whose product is even is ————.
7. In a throw of dice, the probability of getting number greater than 5 is ————.
8. Probability of second event in situation if first event has been occurred is classified as ————.
9. Probability which is based on self-beliefs of persons involved in experiment is classified as ————.
10. Joint probability of independent events J and K is equal to ————.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions from the following.*
Each question carries 2 *marks.*

11. Define Quantitative Technique.
12. What is Rank correlation ?
13. Define Regression.
14. What is Addition theorem of probability ?
15. What is conditional probability ?
16. What is binomial distribution ?
17. What is non-parametric test ?
18. What is ANOVA ?
19. What is negative correlation ?
20. What is inverse probability ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions from the following.*
Each question carries 4 *marks.*

21. Distinguish between correlation and regression.
22. What is binomial distribution ? Explain its properties.
23. Explain the steps involved in F test.
24. The blood groups of 200 people is distributed as follows : 50 have type A blood, 65 have B blood type, 70 have O blood type and 15 have type AB blood. If a person from this group is selected at random, what is the probability that this person has O blood type ?
25. Find the Binomial distribution with mean 3 and variance 2.

26. If 3% of electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs, exactly five bulbs are defective.

27. The scores of students in a test follow Normal Distribution with mean = 80 and SD = 15. A sample of 1000 students has been drawn from the population. Find the appropriate number of students scoring between 65 and 95.

28. A man wants to marry a girl having qualities : white complexion - the probability of getting such a girl is one in twenty; handsome dowry-the probability of getting this is one in fifty; and westernized manner and etiquettes - the probability here is one in hundred. Find out the probability of his getting married to such a girl when the possession of these three attributes is independent.

(6 × 4 = 24 marks)

Part D

Answer any **two** *questions from the following.*
Each question carries 15 *marks.*

29. Quotations of Index Numbers of security prices of a certain joint stock company are given below :

Year		*Debenture price*	*Share price*
1	..	97.8	73.2
2	..	99.2	85.8
3	..	98.8	78.9
4	..	98.3	75.8
5	..	98.4	77.2
6	..	96.7	87.2
7	..	97.1	83.8

Using rank correlation method, determine the relationship between debenture prices and share prices.

30. The following data show the number of seeds germinating out of 10 on damp filter for 80 set of seeds. Fit a binomial distribution to this data :

x :	0	1	2	3	4	5	6	7	8	9	10
f :	6	20	28	12	8	6	0	0	0	0	0

31. Twelve dice were thrown 4096 times. Each 4, 5 or 6 spot appearing was considered to a success, while a 1, 2 or 3 spot was a failure. Calculate the theoretical frequencies for 0, 1, 2,... 12 successes.

(2 × 15 = 30 marks)

D 41921 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE EXAMINATION, APRIL 2018

(CUCBCSS—UG)

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours Maximum : 80 Marks

Part A

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

1 Two events are said to be independent if :

(a) Each outcome has equal chance of occurrence.

(b) There is the common point in between them.

(c) One does not affect the occurrence of the other.

(d) Both events have only one point.

2. If P (A) = 0.5, P (B) = 0.3 and the events A and B are independent then $P(A \cup B)$ is :

(a) 0.8. (b) 0.15.

(c) 0.08. (d) 0.015.

3. For Bernoulli distribution with probability p of a success and q of a failure, the relation between mean and variance that hold is :

(a) mean < variance. (b) mean > variance.

(c) mean = variance. (d) mean <.

4. A hypothesis may be classified as :

(a) Simple. (b) Composite.

(c) Null. (d) All the above.

5. t - distribution ranges from :

(a) $-\infty$ to 0. (b) 0 to ∞.

(c) $-\infty$ to ∞. (d) 0 to 1.

Fill in the blanks :

6. The probability of an impossible event is ————.

7. The mean and variance are ———— in Poisson distribution.

Turn over

8. When $\mu = 0$ and $\sigma = 1$ the normal distribution is called ————.
9. When the hypothesis is false and the test accepts it this is called ————.
10. The variance of a binomial distribution is 2. Its standard deviation is ————.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. What is Complementary events ?
12. What is Sampling Distribution ?
13. What is Alternative Hypothesis ?
14. What is Coefficient of Determination ?
15. What is Addition theorem on probabilities for mutually exclusive events ?
16. What are the uses of Probable Error ?
17. What is variance ?
18. What is zero correlation ?
19. What is standard error ?
20. What are the conditions for binomial distribution ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

21. What are the different methods for measuring coefficient of correlation ?
22. What are theoretical distribution ? Explain its classification.
23. What is hypothesis ? What are the different types of hypothesis ?
24. Explain merits and demerits of standard deviation?
25. The Co-efficient of rank correlation of the marks obtained by 10 students in statistics and English was 0.2. It was later discovered that the difference in ranks of one of the students was wrongly takes as 7 instead of 9. Find the correct result.
26. Two sets of candidates are competing for the positions on the Board of directors of a company. The probabilities that the first and second sets will win are 0.6 and 0.4 respectively. If the first set wins, the probability of introducing a new product is 0.8, and the corresponding probability if the second set wins is 0.3. What is the probability that the new product will be introduced ?

27. Eight coins are tossed simultaneously. Find the probability of getting at least six heads.

28. You are given the following data about advertising and sales :

		Advertisement (in Lakhs)	*Sales (in Lakhs)*
Mean	...	10	90
Standard Deviation	...	3	12

The coefficient of correlation is 0.8. Calculate two regression lines.

(6 × 4 = 24 marks)

Part D

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

29. What is correlation ? Explain the various degrees of correlation.

30. A test was given to five students taken any at random from the fifth class of three schools of a town. The individual scores are :

School I	:	9	7	6	5	8
School II	:	7	4	5	4	5
School III	:	6	5	6	7	6

Carry out the analysis of variance.

31. The following table gives the result of the SSLC examination of a town held in March 1996 :

Age of candidate	:	13	14	15	16	17	18	19	20	21
Percentage of failure	:	39	41	43	34	37	39	49	47	55

Calculate co-efficient of correlation and estimate probable error and standard error.

(2 × 15 = 30 marks)

C 23261 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE EXAMINATION
APRIL 2017

(CUCBCSS-UG)

Complementary Course

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*

Each question carries 1 *mark.*

Choose the correct answer :

1. Mean of Binomial distribution is :

   (a) np. (b) npq.

   (c) n. (d) $\sqrt{npq}$.

2. If the occurrence of one event prevents the possibility of occurrence of others, such events are known as :

   (a) Exhaustive events. (b) Uncertain events.

   (c) Mutually exclusive events. (d) Independent events.

3. When the amount of change in one variable leads to a constant ratio of change in the other variable, correlation is said to be :

   (a) Linear. (b) Non-linear .

   (c) Positive. (d) Negative.

4. Degrees of freedom for variance within samples is :

   (a) k – 1. (b) N – k.

   (c) N – 1. (d) None of the above.

5. The distribution which is known as 'the law of improbable events :

   (a) Poisson distribution. (b) Binomial distribution.

   (c) Normal distribution. (d) All the above.

Fill in the blanks :

6. Rejecting a null hypothesis when it is true is called _____ error.

7. Normal distribution was discovered by _____.

Turn over

8. The test applied for large samples is _____.
9. The tendency of two or more groups or series of items to vary together directly or inversely is called as _____.
10. In case of independent events p (A $\cap$ B) = _____ .

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions from the following.*
Each question carries 2 *marks.*

11. What is Rank correlation?
12. Define Binomial distribution.
13. When Poisson distribution is treated as a limited form of binomial distribution?
14. What is standard normal variate?
15. What are statistic and parameter?
16. Explain standard error.
17. What is meant by analysis of variance?
18. What you mean by non-parametric tests?
19. When the Yates correction is used in x^2 test?
20. What is statistical hypothesis?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions from the following..*
Each question carries 4 *marks.*

21. Explain the differences between correlation and regression.
22. P (A) = 1/13, P (B) =1/4 and P (A $\cup$ B) = 4/13. Find P (A $\cap$ B).
23. A car hire firm has two cars, which it hires out day by day. The number of demands for car on each day is distributed as a Poisson variate with mean 1.5. Calculate the proportion of days on which (i) neither car is used ; (ii) Some demand is refused.
24. Explain the uses of x^2 test.
25. A sample of size 400 was drawn and the sample mean was found to be 99. Test whether this sample could have come from a normal population with mean = 100 and S.D = 8 at 5% level of significance.
26. Explain the properties of Normal curve.

27. Four dice are thrown 162 times. The occurrence of 2 or 3 is considered as success. In how many throws do you expect (i) exactly 2 success ; (ii) at least 1 success.

28. A bag contains 8 balls identical except for colour of which 5 are red and 3 white. A man draws 2 balls at random one after another without replacement. What is the probability that one of the ball drawn is white and the other red? What would be the probabilities if ball drawn were replaced before another ball is drawn?

(6 × 4 = 24 marks)

Part D

Answer any **two** *questions from the following.*
Each question carries 15 *marks*

29. The following figures relate to the number of units sold in 5 different areas by the sales personnel of a firm. Test whether all the 4 sales personnel's were performed equally.

Area	Salesman (Units sold)			
	A	B	C	D
1	80	100	95	70
2	82	110	90	75
3	88	105	100	82
4	75	90	80	65
5	85	115	105	88

30. Fit a Binomial distribution to the data relating to the number of seeds germinating out of 10 damp filters for 80 sets of seeds :

No. of seeds germinated ...	0	1	2	3	4	5	6	7	8	9	10
No. of sets ...	6	20	28	12	8	6	0	0	0	0	0

31. The sales data of 6 shops before and after a special promotional campaign are given below :

Shops	*Sales (before)* Rs. in 000's	*Sales (after)* Rs. in 000's
A	42	47
B	50	60
C	48	55
D	53	58
E	28	32
F	31	38

Can the campaign be judged as success?

(2 × 15 = 30 marks)

Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE EXAMINATION, APRIL 2016

(CUCBCSS—UG)

Complementary Course

BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours Maximum : 80 Marks

Part A

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

1. An event whose occurrence is inevitable is called :
   (a) Sure event. (b) Impossible event.
   (c) Uncertain event. (d) Equally likely events.
2. Mean deviation for Normal distribution is :
   (a) 2/3 σ. (b) 4/5 σ.
   (c) 1/2 σ. (d) None of the above.
3. From the following identify Type I error :
   (a) Accepting a null hypothesis when it is true.
   (b) Rejecting a null hypothesis when it is true.
   (c) Rejecting a null hypothesis when it is false.
   (d) Accepting a null hypothesis when it is false.
4. Let 'S' denote the sample space, then p (S) =
   (a) 0. (b) 1.
   (c) Infinity. (d) $0 \leq P(A) \geq 1$.
5. P (B/A) :
   (a) $\frac{p(A \cap B)}{p(A)}$. (b) $P(A) \times P(B)$.
   (c) $\frac{p(A \cap B)}{P(B)}$. (d) $P(A) + P(B)$.

Fill in the blanks :

6. When the amount of change in one variable leads to a constant ratio of change in another variable, it is known as ———.

7. The parameter of Poisson distribution is ———.
8. Normal distribution with mean = 0 and standard deviation = 1 is known as ———.
9. If A and B are mutually exclusive disjoint events, P (A ∪ B) = ———.
10. Chi-square test was developed by ———.

(10 × 1 = 10 marks)

Part B

Answer any **eight** *questions from the following.*
Each question carries 2 *marks.*

11. What is Quantitative Techniques ?
12. What is a Scatter diagram ?
13. Define probability.
14. Find out the value of 8C3
15. Two coins are tossed. What is the probability of getting at least one head ?
16. State the Addition rule of probability for mutually exclusive events.
17. What is a continuous random variable ?
18. Define Poisson distribution.
19. Mention the assumptions of *t* test.
20. What is Standard error ?

(8 × 2 = 16 marks)

Part C

Answer any **six** *questions from the following.*
Each question carries 4 *marks.*

21. Explain Baye's theorem.
22. Explain the methods of drawing regression lines.
23. How a quantitative technique helps business and industry ?
24. You are given the following data.

		X	Y
Arithmetic mean	...	36	85
Standard deviation	...	11	8

Correlation co-efficient between x and y = 0.66

(i) Find the two regression equations.

(ii) Estimate the value of x when y = 75.

25. Given a normal distribution with mean = 50 and SD = 10 find the value of X that has :

    (a) 13 % of value to its left.

    (b) 14 % of value to its right.

26. The probability that A solves the problem in statistics is 2/5 and the probability that B solves is 3/8. If they try independently find the probability that :

    (i) Both solve the problem.

    (ii) None solve the problem.

    (iii) Atleast one solve the problem.

27. In a box contains 500 apples, 50 are found to be defective. The wholesaler of the apple claims that only 6 % of the apples supplied by him will be defective. Test the claim of the wholesaler.

28. The ranking of 10 individuals at the start and at the finish of a course of a training are as follows :

Individuals	...	A	B	C	D	E	F	G	H	I	J
Rank before	...	1	6	3	9	5	2	7	10	8	4
Rank after	...	6	8	3	2	7	10	5	9	4	1

Calculate Spearman's Rank correlation co-efficient.

(6 × 4 = 24 marks)

Part D

Answer any **two** *questions from the following.*
Each question carries 15 *marks.*

29. In Big Food, a fast food chain feels that it is gaining bad reputation because it takes too time to serve its customers. Since the chain has four restaurants in this town, it is concerned with whether the 4 restaurants have the same average service time. One of the owners of the fast food chain has decided to visit each of the stores and monitor the service time for five randomly selected customers. He recorded the following times in minutes.

Restaurants	*Service time for 5 customers*				
I	3	4	5.5	3.5	4
II	3	3.5	4.5	4	5.5
III	2	3.5	5	6.5	6
IV	3	4	5.5	2.5	3

Test whether all restaurants have the same mean service time. Use ANOVA.

30. Two sample polls of votes for 2 candidates A and B for a public office are taken, one from residents of rural areas and other from among residents of urban areas. The results are given below. Examine whether the nature of the area is related to voting preference in the election.

		Candidates		
Area	...	A	B	Total
Rural	...	620	480	1,100
Urban	...	380	520	900
Total	...	1,000	1,000	2,000

31. Explain various approaches to probability with examples.

(2 × 15 = 30 marks)

C 5111 (Pages : 3) Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE (SUPPLEMENTARY/ IMPROVEMENT) EXAMINATION, MAY 2016

(UG–CCSS)

Complementary Course

BC 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours Maximum : 30 Weightage

Part A

I. Choose the correct answer. Each bunch of four questions carry equal weightage of 1. Answer *all* questions :

1 The probability of an event which cannot occur :

(a) 0. (b) 0.25.

(c) 0.50. (d) 1.

2 In tossing a coin the probability of getting head is :

(a) 0.25. (b) 1/2.

(c) 0.75. (d) 1.

3 S.E. of number of successes is equal in :

(a) $\sqrt{n}$. (b) $\sqrt{np}$.

(c) $\sqrt{npq}$. (d) $\sqrt{nq}$.

4 In analysis of variance degrees of freedom is calculated :

(a) K – 4. (b) K – 3.

(c) K – 2. (d) K – 1.

II. Fill in the blanks :

5 With the help of Scatter diagram one can guess the type of correlation that exists ————.

6 A random variable that takes on a finite number of values is called a ————.

7 Binomial distribution is the important ———— distribution in Statistics.

8 ———— distribution is a discrete probability distribution where the random variable χ assumes an infinite set of integral values 0, 1, 2, 3, . . .

Turn over

III. Answer in single word :

9 State the nature of curve represented by a normal distribution.

10 What is the name of the variable whose average valve is estimated ?

11 State the name of the person who developed the rank correlation coefficient formula.

12 What is the name of the event which may or may not occur while performing a random experiment ?

(12 × ¼ = 3 weightage)

Part B

IV. Answer *all nine* questions. Each question carries a weightage of 1 :

13 Define Correlation.

14 What is positive correlation ?

15 Explain Probable error.

16 Explain mutually exclusive events.

17 Explain Independent events.

18 Define Hypothesis.

19 What is Type II error ?

20 Define χ^2 test.

21 Explain the areas of application of Poisson distribution.

(9 × 1 = 9 weightage)

Part C

V. Answer any *five* questions. Each question carries a weightage of 2 :

22 Write the applications of quantitative techniques in business.

23 What are the important properties of the binomial distribution ?

24 What are the important limitations of quantitative techniques ?

25 What are the important statistical techniques often used in business and industry ?

26 If the probability of a defective bolt is 0.1 find :

(a) The mean.

(b) The standard deviation of defective bolts in a total of 900.

27 In a hospital 480 female and 520 male babies were born in a week. Do these figures confirm the hypothesis that males and females are born in equal number ?

28 There are 5 white and 7 red balls in a bag. A ball is drawn and then replaced. What is the probability that a white and a red ball are drawn in that order ? What would be the probability if the ball drawn were not put back into the bag ?

(5 × 2 = 10 weightage)

Part D

VI. Answer any *two* questions. Each question carries a weightage of 4 :

29 From the following data obtain the two regression equations :

X	:	5	8	7	6	4
Y	:	3	4	5	2	1

30 The following figures give capital employed by a firm in ten successive years together with the profit made in each year, both in crores of rupees :

Capital	:	10	20	30	40	50	60	70	80	90	100
Profit	:	2	4	8	5	10	15	14	20	22	30

Find the coefficient of correlation and give your conclusions.

31 An aptitude test for selecting officers in a bank was conducted on 1,000 candidates the average score is 42 and the standard deviation of scores is 24.

Assuming normal distribution for the scores find :

(a) The number of candidates whose score exceeds 60.

(b) The number of candidates whose score lies between 30 and 60.

(2 × 4 = 8 weightage)

C 81795 (Pages : 4) Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE EXAMINATION, APRIL/MAY 2015

(U.G.—CCSS)

Complementary Course

BC 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours Maximum : 30 Weightage

Part A

This part contains three bunches of questions carrying equal weightage.
Each bunch has four questions.
Answer all **twelve** *questions.*

A. Choose the correct answer from bracket :

1 $P(A|B)$ is equal to :

(a) $\frac{P(A \cap B)}{P(A)}$. (b) $\frac{P(A \cap B)}{P(B)}$.

(c) $\frac{P(A \cup B)}{P(A)}$. (d) $\frac{P(A \cup B)}{P(B)}$.

2 Chi-square distribution is a :

(a) Symmetrical distribution. (b) Discrete distribution.

(c) Skewed distribution. (d) None of the above.

3 The area under the normal curve corresponding to Z = 2.58 is equal to :

(a) ·4999 . (b) ·4950 .

(c) ·4900 . (d) ·4500 .

4 From a study related to degree of association, the coefficient of correlation was equal to zero. It means that there is :

(a) Very high positive correlation.

(b) Very high negative correlation.

(c) No correlation.

(d) Perfect positive correlation.

B. Fill in the blanks :

5 If one event prevents the occurrence of another event, then the two events are said to be ———— events.

6 When the probability of success in a Bernoulli process is 50 per cent $(p = \cdot 5)$; its binomial distribution is ————.

7 The standard error of the mean is calculated by the formula ————.

8 In analysis of variance, the sum of the squares between samples is denoted by ————.

C. Answer in *one word* :

9 The number of degrees of freedom in a 3 × 3 contingency table is :

10 The '*t*' distribution is used when the size of sample is less than :

11 The number of ordered arrangements that can be made by using some or all the items is referred to as :

12 The symbol 'γ' is used to indicate.

(12 × ¼ = 3 weightage)

Part B

Answer all **nine** *questions.*
Each question carries a weightage of 1.

13 What is meant by Linear Programming ?

14 Define quantitative techniques.

15 State any four types of correlation.

16 Give any two uses of regression analysis in Business.

17 Distinguish between priory probability and posteriori probability.

18 Define Binomial distribution.

19 State the conditions for normal distribution being the approximation or limiting form of Binomial distribution.

20 What are Parametric tests ?

21 Define 'Chi-square'.

(9 × 1 = 9 weightage)

Part C

Answer any **five** *questions.*
Each question carries a weightage of 2.

22 Explain the technique of analysis of variance for a two-way classification.

23 Given that $P(A) = \frac{3}{14}$; $P(B) = \frac{1}{6}$; $P(C) = \frac{1}{3}$; $P(A \text{ and } C) = \frac{1}{7}$; and $P(B/C) = \frac{5}{21}$. Find the following probabilities :

(a) $P(A/C)$. (b) $P(C/A)$.

(c) P (B and C). (d) $P(C/B)$.

24 A box contains 10 bad apples and 40 good apples. Three apples are drawn at random from the box. Determine the probability that :

(a) Atleast one is good. (b) Utmost two are good.

25 The per acre yield of crop in a particular area is observed to follow a normal distribution with mean 150 quintals and standard deviation 50 quintals. Find (i) the proportion of area yielding at least 250 quintals ; (ii) what extent of land under the crop can yield between 100 and 200 quintals, if the total area under crop is 100 acres.

26 From the following values of X and Y find the regression equation X on Y :

X:	2	3	5	6	7
Y:	1	2	4	5	8

27 From the following data relating to yield of three varieties, sown in four blocks, test whether there is difference between varieties as far as output is concerned :

Blocks	*Varieties*		
	A	B	C
1 ..	6	7	8
2 ..	4	6	5
3 ..	8	6	10
4 ..	6	9	9
Total	24	28	32

28 Prices of shares of a company on different days in a month were found to be : 71, 70, 63, 68, 64, 69, 70, 65, 66 and 69. Discuss whether mean price of the share in the month is 65.

(5 × 2 = 10 weightage)

Part D

Answer any **two** *questions.*
Each question carries a weightage of 4.

29. (a) What do you understand by the term probability ?

(b) State the addition theorem and multiplication theorem of probability.

(c) Explain Baye's theorem.

30 The following data relate to age of employees and the number of days they reported sick in a month :

Age of Employees	X :	30	32	35	40	48	50	52	55	57	61
Sick days	Y :	1	0	2	5	2	4	6	5	7	8

Calculate Karm Pearson's coefficient of correlation and interpret it.

31 Fit a Poisson distribution to the following data and calculate theoretical frequencies :

No. of mistakes per page	:	0	1	2	3	4	5
No. of pages	:	142	156	69	27	5	1

(2 × 4 = 8 weightage)

C 5431 (Pages : 2) Name.....

Reg. No.....

FOURTH SEMESTER B.Com. DEGREE (UG—CCSS) [SUPPLEMENTARY/ IMPROVEMENT] EXAMINATION, MAY 2016

(SDE)

Complementary Course

BC 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Two Hours and Forty-Five Minutes Maximum : 27 Weightage

Part B

Answer only in **English.**

SECTION A

I. Answer all *nine* questions in one *or* two sentences each. Each question carries a weightage of 1 :

1 What do you mean by permutation ?

2 Write a note on measures of central tendency.

3 What is positive correlation ?

4 What do you mean by two tailed test ?

5 What is meant by type I error ?

6 Write a note on probable error.

7 What is one-way analysis of variance ?

8 What is Chi-square test ?

9 What is a null hypothesis ?

(9 × 1 = 9 weightage)

SECTION B

II. Answer any *five* questions in not exceeding *one page* each. Each question carries a weightage of 2 :

10 What do you mean by programming techniques ? Examine important techniques.

11 Examine various stages in testing the hypotheses.

12 The ranking of 6 individuals before and after an orientation programme are as follows :

Individuals	...	A	B	C	D	E	F
Rank before	...	3	5	4	2	1	6
Rank after	...	4	6	5	2	1	3

Compute the Spearman's rank correlation.

13 The details of monthly wages paid to workers in two firms A and B belonging to the same industry are as follows :

	Firm A	*Firm B*
Number of workers	550	650
Average monthly wages	50	45
Standard Deviation	$\sqrt{90}$	$\sqrt{120}$

Turn over

(a) Which firm A or B pays larger amount as wages ?

(b) What are the average monthly wages in the distribution of individual wages of all workers in the two firms taken together ?

(c) In which firm A or B has greater variability in their individual wages ?

14 Coefficient of correlation between two variables is calculated to be – 0.98. Find the value of probable error and hence interpret the result (n = 10). Find the limits within which population correlation coefficient lie.

15 You are given the following information about advertising and sales :

Values	*Advertising cost* (Rs. in lakhs)	*Sales* (Rs. in lakhs)
Mean	10	90
Standard deviation	3	12

The correlation coefficient is 0.80

(a) Calculate the two regression lines.

(b) Ascertain the anticipatory sales, when the cost of advertisement is rupees 1 lakh.

16 A committee of 6 members is to be formed out of a group consisting of 7 men and 4 ladies. What is the probability that the committee will consist of : (a) Exactly 2 ladies and (b) At least 2 ladies.

(5 × 2 = 10 weightage)

Section C

III. Answer any *two* questions in not exceeding *four pages*. Each question carries a weightage of 4 :

17 The following table gives the result of SSLC Examinations held in 2014.

Age of candidates ...	13	14	15	16	17	18	19	20	21
Percentage of failures ...	39	41	43	34	37	39	49	47	55

Calculate coefficient of correlation and estimate the probable error.

18 The following data relate to the yield of 4 varieties of rice each sown on 5 plots. Find whether there is significant difference between the mean yields of these varieties.

	Treatment			
Plot Name	1	2	3	4
P	99	103	109	104
Q	101	102	103	100
R	103	100	107	103
S	99	105	97	107
T	98	95	99	106

19 Examine the procedures of testing hypothesis. Also explain about parametric tests.

(2 × 4 = 8 weightage)