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Name.....

Reg. No.....

**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2025**

B.B.A.

BBA 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2019—2023 Admissions)

Time : Two Hours and a Half

Maximum : 80 Marks

Part A*Answer all questions.*

1. What is a Venn Diagram ?
2. What is meant by regression ?
3. What is meant by Normal distribution ?
4. What is meant by Rank Correlation ?
5. What is meant by Probable Error ?
6. What are Irregular Variations ?
7. What are Complementary events ?
8. What is meant by Base Shifting ?
9. What is Correlation ?
10. What are cyclical variations ?
11. What is Index Number ?
12. What is meant by Multiple Correlation ?
13. What is Conditional Probability ?
14. What is meant by Baye's Theorem ?
15. What is meant by discrete probability distribution ?

(15 × 2 = 30, Maximum ceiling 25 Marks)

Turn over

Part B*Answer all questions.*

16. State the steps in construction of Consumer Price Index.
17. State the differences between positive and negative correlation.
18. State the merits and demerits of Pearson's Coefficient of Correlation.
19. Calculate co-efficient of correlation by concurrent deviation method :—

Year	:	2003	2004	2005	2006	2007	2008	2009	2010	2011
Supply	:	160	164	172	182	166	170	178	192	186
Price	:	292	280	260	234	266	254	230	190	200

20. Two unbiased dice are thrown. Find the probability that : -

Both the dice show the same number

One die shows 6

First die shows 3

Total of the numbers on the dice is 9

Total of the numbers on the dice is greater than 8

A sum of 11

21. Calculate the six-year moving average :

Years	:	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Demand	:	105	120	115	110	100	130	135	160	155	140	145

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22. Construct index numbers for 2012 on the basis of the price of 2010 :

Commodities	Price in 2010	Price in 2012
A	115	130
B	72	89
C	54	75
D	60	72
E	80	105

23. For a Binomial Distribution, mean is 6 and Standard Deviation is $\sqrt{2}$. Find the parameters ?

(8 × 5 = 40 Maximum ceiling 35 Marks)

Part C

Answer any two questions.

Each question carries 10 marks.

24. Write an essay on various classification of correlation.
25. Write an essay on various methods of measuring correlation.
26. Two variables gave the following data

$$\bar{x} = 20, \sigma_x = 4, r = 0.7$$

$$\bar{y} = 15, \sigma_y = 3.$$

Obtain regression lines and find the most likely value of y when $x = 24$.

27. Following were the ranks given by three judges in a beauty context. Determine which pair of judges has the nearest approach to Common tastes in beauty :

Judge 1	;	1	6	5	10	3	2	4	9	7	8
Judge 2	:	3	5	8	4	7	10	2	1	6	9
Judge 3	:	6	4	9	8	1	2	3	10	5	7

(2 × 10 = 20 marks)

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Name.....

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**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2024**

B.B.A.

BBA 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2019 Admission onwards)

Time : Two Hours and a Half

Maximum : 80 Marks

Part A*Answer all questions.*

1. What is Correlation ?
2. What are cyclical variations ?
3. What is Index Number ?
4. What is meant by Multiple Correlation ?
5. What is Conditional Probability ?
6. What is meant by Baye's Theorem ?
7. What is meant by discrete probability distribution ?
8. What is meant by Binomial Distribution ?
9. What is meant by Poisson Distribution ?
10. What is meant by Perfect Correlation ?
11. What is meant by Quantity Index Number ?
12. What are Mutually Exclusive Events ?
13. What is moving average ?
14. What is Regression line ?
15. What are Unweighted Index Numbers ?

(15 × 2 = 30, Maximum ceiling - 25 Marks)

Turn over

Part B*Answer all questions.*

16. What is the probability of obtaining at least one head in the simultaneous toss of two unbiased coins ?
17. State the differences between positive and negative correlation ?
18. State the Properties of Regression Co-efficients ?
19. Calculate co-efficient of correlation by concurrent deviation method :—

Year	:	2003	2004	2005	2006	2007	2008	2009	2010	2011
Supply	:	160	164	172	182	166	170	178	192	186
Price	:	292	280	260	234	266	254	230	190	200

20. Among 60 people, 35 can speak in English, 40 in Malayalam and 20 can speak in both the languages. Find the number of people who can speak at least one of the languages. How many cannot speak in any of these languages ?
21. Following are the data related with the output of a factory for 7 years :

Years	:	2006	2007	2008	2009	2010	2011	2012
Output (in tones)	:	47	64	77	88	97	109	113

Calculate the trend values through the method of least squares and also forecast the production 2013 and 2015.

22. If $r = 0.6$ and $N = 64$, find out the PE and SE of the correlation co-efficient. Also determine the limits of population correlation co-efficient ?
23. It is known from the past experience that in a certain plant, there are on an average four industrial accidents per year. Find the probability that in a given year there will be less than four accidents. Assume Poisson distribution ?

(8 × 5 = 40, Maximum ceiling - 35 Marks)

Part C

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

24. Write an essay on various methods of measuring correlation ?
25. Two variables gave the following data

$$\bar{x} = 20, \sigma_x = 4, r = 0.7$$

$$\bar{y} = 15, \sigma_y = 3$$

Obtain regression lines and find the most likely value of y when $x = 24$.

26. Find the correlation co-efficient between age and playing habits of the following students using Karl Pearson's co-efficient of correlation method :

Age	:	15	16	17	18	19	20
Number of students	:	250	200	150	120	100	80
Regular Players	:	200	150	90	48	30	12

27. Following are the data related with the prices and quantities consumed for 2010 and 2012 :

Commodity	2010		2012	
	Price	Quantity	Price	Quantity
Rice	5	15	7	12
Wheat	4	5	6	4
Sugar	7	4	9	3
Tea	52	25	55	2

- 1 Laspeyre's method.
- 2 Paasche's method.
- 3 Bowly's - Dorbish method.
- 4 Fisher's method.

(2 × 10 = 20 marks)

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**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2023**

B.B.A.

BBA 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2019 Admission onwards)

Time : Two Hours and a Half

Maximum : 80 Marks

Part A*Answer all questions.*

1. Write any *two* limitations of quantitative techniques.
2. What is meant by negative correlation ?
3. What is a scatter diagram ?
4. What are the properties of regression lines ?
5. Which are the types of regression ?
6. What are cyclical variations ?
7. Which are the models of time series analysis ?
8. What are quantity index numbers ?
9. Why chain index numbers assume significance ?
10. What is meant by complement of a set ?
11. What are exhaustive events ?
12. What are the limitations of relative frequency theory of probability ?
13. Which are the constants of Poisson distribution ?
14. What is Baye's theorem ?
15. Give multiplication theorem for independent events.

(15 × 2 = 30, Maximum ceiling 25 marks)

Turn over

Part B*Answer all questions.*

16. Write the important uses of quantitative techniques in the field of business and industry ?

17. Which are the different methods for measuring correlation ?

18. Given :

Covariance between X and Y = 16

Variance of X = 25

Variance of Y = 16

(i) Calculate coefficient of correlation between X and Y.

(ii) If arithmetic means of X and Y are 20 and 30 respectively., find regression equation of Y on X.

(iii) Estimate Y when X = 30.

19. Calculate five yearly moving averages for the following data :

Year :	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Value :	123	140	110	98	104	133	95	105	150	135

20. An enquiry into the budgets of the middle class families in a city in India gave the following information :

	<i>Food</i>	<i>Rent</i>	<i>Clothing</i>	<i>Fuel</i>	<i>Others</i>
Expenses	35 %	15 %	20 %	10 %	20 %
Price in 2011	150	50	100	20	60
Price in 2012	174	60	125	25	90

What change in the cost of living of 2012 has taken place as compared to 2011

21. 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 ?

22. A ball is drawn at random from a box containing 6 red balls, 4 white balls and 5 blue balls. Determine the probability that it is : (i) Red ; (ii) White ; (iii) Blue, (iv) Not Red ; and (v) Red or White.
23. Explain Axiomatic Approach (Modern Approach) to Probability.

(8 × 5 = 40, Maximum ceiling 35 marks)

Part C

Answer any two questions.

24. Calculate co-efficient of correlation from following data :

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

25. Fit a straight line trend to the following data by Least Squares method and estimate exports for the year 2012.

Year	:	2003	2004	2005	2006	2007	2008	2009
Export (in tons):		47	50	53	65	62	64	72

Solve by : (1) Taking 2005 as the year of origin ; (2) Taking middle year of the time series as origin and also verify the result.

26. Explain the method of construction of index numbers.
27. Eight coins were tossed together for 256 times. Fit a Binomial Distribution of getting heads. Also find mean and standard deviation.

(2 × 10 = 20 marks)

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Name.....

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FOURTH SEMESTER (CBCSS-UG) DEGREE EXAMINATION, APRIL 2022

B.B.A.

BBA 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

(2019 Admission onwards)

Time : Two Hours and a Half

Maximum : 80 Marks

Section A*Answer atleast ten questions.**Each question carries 3 marks.**All questions can be attended.**Overall ceiling 30.*

1. List the mathematical techniques used for business decisions.
2. Write the significance of correlation analysis.
3. Which are the graphic methods of ascertaining correlation ?
4. What are the features of regression coefficients ?
5. Write a note on least square method of computing regression equation.
6. What are seasonal variations ?
7. Which are the methods used for studying the trend component in a time series ?
8. What are the uses of index numbers ?
9. What are the advantages of fisher's ideal method ?
10. What is meant by 'difference of two sets' ?
11. What is a random experiment ?
12. What are equally likely events ?
13. What are Venn diagrams ?
14. What are the properties of binomial distribution ?
15. Which are the practical situations where Poisson distribution can be used ?

(10 × 3 = 30 marks)

Turn over

Section B

Answer atleast **five** questions.

Each question carries 6 marks.

All questions can be attended.

Overall ceiling 30.

16. What are the Functions of Quantitative Techniques ?
17. From the following data, compute coefficient of correlation (r) between X and Y :

	X series	Y series
Arithmetic Mean	... 25	18
Square of Deviations from A.M.	... 136	138
Summation of products of deviations of X and Y series from their respective means	...	122
Number of pairs of values	...	15

18. Following data relates to marks in accounts and statistics in B. Com. (Hons.) I Year Examination of a particular year in University of Delhi :

	Accounts	Statistics
Mean	... 30	35
Standard deviation	... 10	7
Coefficient of correlation	...	0.8

Find two regression equations and calculate the expected marks in accounts if marks secured by a student in statistics are 40.

19. Calculate 4 yearly moving average of the following data :

Year	...	2005	2006	2007	2008	2009	2010	2011	2012
Wages	...	1150	1250	1320	1400	1300	1320	1500	1700

20. Compute the price index as per the following methods : (1) Laspeyres' and (2) Paasche's from the following data :

Item	p_0	q_0	p_1	q_1
A	10	4	12	6
B	15	6	20	4
C	2	5	5	3
D	4	4	4	4

21. Which are the different of Sets ?
22. A bag contains 7 red, 12 white and 4 green balls. What is the probability that : (a) 3 balls drawn are all white and (b) 3 balls drawn are one of each colour ?
23. What are the Properties of Normal Distribution (Normal Curve) ?

(5 × 6 = 30 marks)

Section C

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

24. Find correlation between age of husband and age of wife.

Age of Husband (X) ...	46	54	56	56	58	60	62
Age of Wife (Y) ...	36	40	44	54	42	58	54

25. Fit a straight line trend to the following data and estimate the likely profit for the year 2012. Also calculate the trend values :

Year ...	2003	2004	2005	2006	2007	2008	2009
Profit (in lakhs of ₹) ...	60	72	75	65	80	85	95

26. You note that your officer is happy on 60%. of your calls, so you assign a probability of his being happy on your visit as 0.6 or 6/10. You have noticed also that if he is happy, he accedes to your request with a probability of 0.4 or 4/10 whereas if he is not happy, he accedes to the request with a probability of 0.1 or D or $\frac{1}{10}$. You call one day, and he accedes to your request. What is the probability of his being happy ?
27. A Systematic sample of 100 pages was taken from a dictionary and the observed frequency distribution of foreign words per page was found to be as follows :

No. of foreign words per page (x) :	0	1	2	3	4	5	6
Frequency (f) :	48	27	12	7	4	1	1

Calculate the expected frequencies using Poisson Distribution.

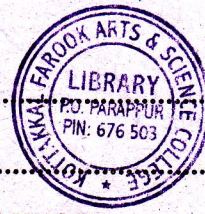
(2 × 10 = 20 marks)

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Name.....

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**FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021**

B.B.A.

BBA 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Two Hours and a Half

Maximum : 80 Marks

Section A

Answer at least ten questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 30.

1. What are Quantitative Techniques ?
2. When two or more variables are said to be correlated ?
3. Which are the different Degrees of correlation ?
4. What are regression lines ?
5. What are regression co-efficients ?
6. Which are the components of a time series ?
7. Write a note on the method of Semi averages.
8. What are Index Numbers ?
9. What are the advantage and disadvantages of Laspeyres' Price Index ?
10. Which are the Methods of Describing a Set ?
11. What are Mutually exclusive events ?
12. What are Disjoint Sets ?
13. What are the limitations of Classical Approach (Priori Probability).
14. What are the conditions for using Binomial distribution ?
15. Distinguish between Discrete Probability Distribution and Continuous Probability Distributions.

(10 × 3 = 30 marks)

Turn over

Section B

Answer at least five questions.

Each question carries 6 marks.

All questions can be attended.

Overall Ceiling 30.

16. How Quantitative Techniques can be classified ?
17. How correlation can be classified ?
18. The line of regression of marks in statistics (X) on marks in accountancy (Y) for a class of 50 students is $3Y - 5X + 180 = 0$. Average mark in accountancy is 44 and variance of marks in statistics is $\frac{9}{16}$ of variance of marks in accountancy. Find :
- Average marks in Statistics.
 - Co-efficient of correlation between X and Y.
19. The wages of certain factory workers are given as below. Using 3 yearly moving average indicate the trend in wages :
- | | | | | | | | | | | |
|-------|---|------|------|------|------|------|------|------|------|------|
| Year | : | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Wages | : | 1200 | 1500 | 1400 | 1750 | 1800 | 1700 | 1600 | 1500 | 1750 |
20. What are the problems involved in construction of index numbers ?
21. Rewrite the following examples using set notation : (i) First ten even natural numbers ; (ii) Set of days of a week ; (iii) Set of months in a year which have 30 days, (iv) The numbers 3, 6, 9, 12, 15. ; and (v) The letters $m, a, t, h, e, m, a, t, i, c, s$.
22. The average percentage of failure in a certain examination is 40. What is the probability that out of a group of 6 candidates, at least 4 passed in the examination ?
23. An aptitude test was conducted for selecting officers in 4 bank from 1000 students. The average score is 42 and the Standard Deviation is 24. Assume normal distribution for scores and find :
- The number of candidates whose score exceed 58.
 - The number of candidates whose score lie between 30 and 66.

(5 × 6 = 30 marks)

Section C

Answer any two questions.

Each question carries 10 marks.

24. From the data given belows calculate the rank correlation between X and Y :

X	:	78	89	97	69	59	79	68	57
Y	:	125	137	156	112	107	136	123	108

25. Fit a straight line trend to the following data by Least Square Method and estimate the sale for the year 2012 :

Year	:	2005	2006	2007	2008	2009	2010
Sale (in '000s)	:	70	80	96	100	95	114

26. Explain different definitions of Probability.
27. 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

(2 × 10 = 20 marks)