DEPARTMENT OF COMMERCE

QUESTION BANK FOR B COM (Computer Application & Taxation) Semester IV

QUANTITATIVE TECHNIQUES FOR BUSINESS - II

MODULE 1 CORRELATION

CO1- Examine correlation techniques (Analyse)

SECTION A

1. Explain correlation.
2. What is perfect correlation?
3. Summarize Probable Error?
4. Analyze multiple correlation?
5. Examine rank correlation?
6. Evaluate spurious correlation?
7. Illustrate partial correlation?
8. Discover non-linear correlation?
9. Simplify coefficient of determination?
10. Interpret coefficient of alienation?
11. What is coefficient of non-determination?
12. Label standard error of correlation coefficient?
13. If r=0.8 and N = 81 find out Probable error of coefficient of correlation.
14. If co-variance between X and Y variables is 9.6 and the variance of X and Y are respectively 16 and 9 find the coefficient of correlation.

SECTION B

15. Demonstrate the types of correlation.
16. Explain how correlation can be studied using Scatter diagram method.
17. Translate how correlation can be studied using Correlation graph method.
18. List out the merits and demerits of scatter diagram method
19. Examine the characteristics of Karl Pearson's Coefficient of correlation.
20. Find coefficient of concurrent deviation from the following:

X	85	91	56	72	95	76	89	51	59	90
Y	18	20	16	15	19	18	17	14	18	15

21. Illustrate Karl Pearson's coefficient of correlation from the following:

X	300	350	400	450	500	550	600	650	700
Y	800	900	1000	1100	1200	1300	1400	1500	1600

22. Find out the coefficient of rank correlation from the following:

Marks by judge A	80	78	75	75	68	67	60	59
Marks by judge B	72	78	84	84	84	96	90	98

SECTION C

23. Interpret coefficient of correlation by concurrent deviation method from the following data

X	112	125	126	118	118	121	125	125	131	135
Y	106	102	102	104	98	96	97	97	95	90

24. Solve coefficient of correlation by means of ranking method from the data given

X	40	50	60	60	80	50	70	60
Y	800	1200	1600	1700	1300	2000	2100	1300

25. Apply spearman's rank coefficient of correlation from the following

X	60	56	70	80	45	50	48	85	90	88
Y	65	42	67	82	38	52	40	87	92	85

26. Solve Karl Pearson's coefficient of correlation between age and success in an examination by means of ranking method from the data given

Age	15	16	17	18	19	20	21	22
Candidate appeared	200	300	100	50	150	400	250	150
Successful candidates	120	180	60	30	90	250	140	80

MODULE 2 REGRESSION ANALYSIS

CO2-Categorize regression and correlation(Analyse)

SECTION A

1. Explain regression?
2. Summarize the characteristics of regression analysis?
3. What is regression line of X on Y?
4. Extend linear regression?
5. Outline Total Regression?
6. Identify Regression Coefficients?
7. Interpret Standard Error of Estimate?
8. Label regression line of Y on X?
9. Evaluate Simple and Multiple Regression?
10. Extend Linear and Non- Linear Regression?

SECTION B

11. Distinguish between correlation and regression.
12. What is Regression? What are the different types of Regression Analysis?
13. The following data based on 450 students, are given for marks in Statistics and Mathematics. Examine average marks in Mathematics of a student who secured 50 marks in Statistics.

	Statistics	Maths
Mean Marks	40	48
Standard Deviation	12	16

Sum of products of deviation of marks from their respective mean = 42075.

14. The following are the results of the two series X and Y

$\Sigma x^2 = 6360$ $\Sigma y^2 = 2860$ $\Sigma xy = 3900$ Mean of X = 90 Mean of Y= 70

Solve the two regression coefficients, regression equations and coefficient of correlation.

15. You are given the following data about advertising expenditure and sales

	Advertising (Rs. in lakhs)	Sales(Rs. in lakhs)
Arithmetic mean	10	90
Standard Deviation	3	12

The correlation coefficient is 0.8

Find out the two regression coefficients and two regression equations.

16. In order to find the correlation coefficient between two variables X and Y from 12 pairs of observations, the following data were obtained:

$\Sigma X^2 = 670$ $\Sigma Y^2 = 285$ $\Sigma XY = 344$ $\Sigma X = 30$ $\Sigma Y = 5$

Later on it was discovered that the pair (X =11, Y=4) was copied wrongly and the correct values are (X= 10, Y= 14). Apply the correct regression coefficients, regression equations and correlation coefficient.

SECTION C

17. The following data gives the age and blood pressure of ten persons:

Age	56	42	36	47	49	42	60	72	63	55
Blood Pressure	147	125	118	128	145	140	155	160	149	150

. Solve the regression equation of X on Y and Y on X.
a. Evaluate the blood pressure of a person whose age is 45.
b. Illustrate the age when the BP is 170.
c. Find out the correlation coefficient between X and Y.

18. The following data shows the maximum and minimum temperature on a certain day at 10 cities located at different parts of India:

Max. Temp	29	23	25	15	27	29	24	31	32	35
Min. Temp	8	3	7	5	8	19	10	7	5	8

a. Solve the Regression line of X on Y and Y on X.
b. Solve the Maximum Temperature when the Minimum Temperature is 12.
c. Find out the Minimum Temperature when the Maximum Temperature is 40.
d. Apply Karl Pearson's Coefficient of Correlation.

19. From the data given below, find out:
    a. The two regression equations.
    b. Most likely age of wife when husband's age is 25.
    c. Most likely age of husband when wife's age is 19.

Age of husband	25	30	40	42	50	28	34	27	23	31
Age of wife	24	26	32	39	46	22	30	23	20	30

MODULE 3 INDEX NUMBERS
CO3-Evaluate the price and quantity using index numbers
(Evaluate)

SECTION A

1. Determine Index number.
2. Explain Price index number?
3. Interpret quantity index number?

4. Examine value index number?
5. Simplify weighted index number?
6. Summarize cost of living index number?
7. Assess fixed base index number?
8. Inspect chain base index number?
9. Judge link relatives?
10. Outline time reversal test?
11. Evaluate factor reversal test?
12. Identify unit test?
13. Contrast circular test?
14. Demonstrate base shifting?
15. What is splicing?
16. Define deflating?

SECTION B

17. Explain the utilities of index numbers.
18. List out the problems in construction of index numbers?
19. Distinguish between fixed base and chain base index numbers.
20. What is fixed base index? Explain its merits and demerits.
21. Evaluate chain base index? Examine its merits and demerits.
22. Construct Price index number for 2018 taking 2017 as base using Laspeyre's, Paasche's and Fisher's method

Commodity	Price(2017)	Quantity(2017)	Price(2018)	Quantity(2018)
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	15

23. From the following data, Solve Price index number under weighted average of price relatives method.

Commodity	Price in 2008	Price in 2018	Weight
Rice	20	50	5
Wheat	10	30	3
Sugar	20	40	2

24. From the following data construct the index number for 2018 by the family budget method

Commodity	Price 2008	Quantity 2008	Price 2018	Quantity 2018
Rice	20	8	40	10
Wheat	10	7	15	8
Sugar	20	2	40	3
Oil	50	2	75	2

SECTION C

25. Apply Fisher's Ideal Index from the following data and show whether it satisfies both time reversal and factor reversal tests.

Commodity	Price 2017	Expenditure 2017	Price 2018	Expenditure 2018
A	8	80	10	120
B	10	120	12	96
C	5	40	5	50
D	4	56	3	60
E	20	100	25	150

26. Findout the change in cost of living for 2018 as compared to 2010.

Items	Food	Rent	Clothes	Fuel	Misc.
Expenses(in %)	35	20	20	10	15
Price(2010)	2000	800	1000	400	1000
Price(2018)	4000	1000	1200	600	2000

It is decided by the management to introduce the system of payment of DA to its workers from the beginning of 2019. What is the amount of DA that a worker is entitled to get if he has been drawing a salary of Rs. 20,000/- per month for the last 8 years?

27. From the following Solve Price Index Number and Quantity Index Number using

a)Laspeyre's, b)Paasche's and c) Fisher's method

Commodities	Base Year		Current Year	
	Price	Value	Price	Value
A	10	100	12	144
B	12	144	14	196
C	14	196	16	256
D	16	256	18	324
E	18	324	20	400

MODULE 4 TIME SERIES ANALYSIS
CO4- Determine the trend based on time series analysis
(Evaluate)

SECTION A

1. Define Time Series.
2. What is cyclical variation?
3. Extend Secular Trend?
4. Categorize Seasonal Variation?
5. Explain least square method?
6. Identify Linear Trend?
7. Illustrate Multiplicative Model?
8. Discover Irregular Variation?
9. Estimate Freehand Curve Method?
10. Examine Additive Model?
11. Interpret Semi-Average Method?
12. Outline "Shifting the Origin" in Time Series Analysis?
13. The trend equation of annual sales of XY Company Ltd. is Y=81.6+28.8X
    (Origin- 2017, X-Unit: 1 Year, Y unit annual sales)
    Convert the equation to monthly basis.

SECTION B

14. Interpret Analysis of Time Series? Explain its utilities(importance).
15. Categorize the components of Time Series? Explain.
16. Summarize Freehand Curve method of Time Series Analysis? Classify its merits and demerits.
17. Evaluate Seasonal Variation? Illustrate with few examples.
18. You are given the following trend equation:

Y=12+0.7X
(Origin: July 2018; X-unit = 1 year)
Shift the origin to January 2018.

19. You are given the following trend equation:
Y=120-3X
(Origin: 2018, X-unit= 1 year)
Shift the origin to 2013.

20. Appraise the Components of Time series.

SECTION C

21. Given below are the figures of production (in thousand tonnes) of a Sugar Factory.

Year	2011	2012	2013	2014	2015	2016	2017
Production ('000 tonnes)	40	45	46	42	47	50	46

Fit a straight line trend by the Least Squares Method and tabulate the trend values. Also find the short term oscillation. Estimate the production for the year 2018. What is the annual and monthly increase in production.

22. Estimate & Fit a straight line trend by the method of least squares and find out the trend values. Also estimate the sales of the year 2019.

Year	2011	2012	2013	2014	2015	2016	2017	2018
Sales (in lakhs)	80	90	92	83	94	99	92	104

23. Below are given the annual production of Tea in Kanan Devan factory at Munnar:

Year	2011	2012	2013	2014	2015	2016	2017
Production ('000 tonnes)	70	75	90	91	95	98	100

. Fit a straight line by the method of Least Squares and tabulate the trend values.
a. Estimate the production for the year 2018.
b. Eliminate the trend using Additive Model. What components of the Time Series are left over.
c. How to calculate monthly increase in production?
d. Convert your annual trend equation into a monthly trend equation.

MODULE 5 PROBABILITY
CO5- Employ permutation and combination

(Apply)

SECTION A

1. Define probability
2. What do you mean by the term Permutation?
3. When do you mean by the term Combination?
4. Distinguish between Permutation and Combination.
5. Explain classical probability.
6. What is subjective probability?
7. Explain Baye's theory.
8. Demonstrate independent events?
9. Summarize the meaning of mutually exclusive events.
10. Define sample space and sample point.

SECTION B

11. Find out the probability of taking 2 balls of 2 different colours from a bag which contains 7 red, 5 blue and 3 black balls.
12. What is the probability of getting 3 white balls in draw of 3 balls from a box containing 5 white and 4 black balls
13. A committee of 5 is to be formed from a group of 8 boys and 7 girls.
    Find the probability that the committee consist of.
    3boys and 2girls
    At least one girls
14. An unbiased die thrown twice. Solve the probability that both throw show same number of dots.
15. A committee of 6 is to be formed from a group of 7 men and 4 women
    Find the probability that the committee consist of.
    a. Exactly 2 women
    b. At Least 2 women
    c. At the most 2 women
16. A bag contains S Red and 3 Green balls. Two balls are drawn at random one after another with replacement. Find out the probability that both the balls drawn are green.
17. A bag contains 5 Red and 3 Green balls. Two balls are drawn at random one after another without replacement. What is the probability that both the balls drawn are green?
18. A bag contains 10 Red and 13 Green balls. Two balls are drawn at random one after another without replacement. Find out the probability that both the balls drawn are green?
19. A coin is tossed 4 times. What is the probability that the four are heads?
20. A bag contains 8 Red and 5 White balls. Two successive drawings of 3 balls are made such that Balls are replaced before the second trial;
    Balls not replaced before the second trial

Solve the probability that the first draw will give 3 white and the second will give 3 red balls.

SECTION C

21. Find out the number of ways in which a cricket team consisting of 11 players can be selected from 14 players. Also find out how many of these a) will include captain b) will not include captain.
22. Find the number of ways which a committee of 4 Americans, 3 Englishmen and 2 Frenchmen can be formed from a group consisting of 7 Americans, 6 Englishmen and 4 Frenchmen
23. How many combinations can be formed of 8 customers marked 1,2,3,4,5,6,7,8. .Taking them 4 at a time there being at least one odd and one even counter, in each combination?
24. The odds are 7 to 5 against a person who is now 30years old living till he is 70 years and the odds are 2 to 3 in favour of B who is now 40 years age living till he is 80 years. Find the chance that one at least of these two persons will be alive 40 years hence.
25. Find the number of ways which a committee of 8 ladies, 6 men and 4 girls can be formed from a group consisting of 7 ladies, 6 men and 4 girls.
26. Three person A B and C are simultaneously shooting a target. Probability of A hitting the target is ¼ that of B is ½ and that of C is ⅔ and find the probability
    a) exactly one of them will hit the target
    b) at least one of them will hit the target.
27. A speaks truth in 70% cases and B is 85% cases. In what percentage of cases are they likely to contradict each other in stating the same fact.