

B.COM. DEGREE EXAMINATION - APRIL 2023
COMMERCE
SECOND SEMESTER

COURSE : ALLIED – CORE
COURSE TITLE : BUSINESS STATISTICS
TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

Answer all questions:

(10 x 2 = 20)

1. What are the components of Time Series?
2. What is Simple Regression?
3. What is the Significance of ANOVA?
4. List out the types of Errors in Testing of Hypothesis.
5. What are the uses of chi square test?

6. Calculate Rank Correlation

X	48	33	40	9	16
Y	13	15	24	6	20

7. Calculate trend value by 5 yearly moving averages method for the following data.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Production in tonnes	4	5	5	6	7	8	9	8	10

8. Is a correlation co-efficient of 0.5 significant, if obtained from a random sample of 11 pairs of values from a normal population? Use t –test.
9. Calculate the Expected Value (Frequency) from the following

	Affected	Not Affected
Inoculated	12	26
Not inoculated	16	6

10. Calculate the F Value

$$S_1^2 = 91.75$$

$$S_2^2 = 129.8$$

SECTION – B

Answer any FIVE questions:

(5 x 8 = 40)

11. You are given below the following information about the Advertisement and Sales

	Advertisement Expenses (X) (Rs. Crore)	Sales (Y) Rs. Crore
Mean	10	90
S. D	3	12

Correlation Co-efficient = 0.8

- (a) Calculate the two Regression Lines
 (b) Find the likely Sales when Advertisement Expenditure is Rs. 15 Crore
 (c) What should be the Advertisement Expenditure if the company wants to attain Sales Target of Rs. 120 Crore?

12. Find out the co-efficient of correlation for the following data :

X	100	200	300	400	500	600	700
Y	30	50	60	80	100	110	130

13. In an anti-malarial campaign in a certain area, Quinine was administered to 812 persons out of a total population of 3,248. The number of fever cases is shown below:

Treatment	Fever	No Fever	Total
Quinine	20	792	812
No Quinine	220	2,216	2,346
	240	3,008	3,248

Discuss the usefulness of Quinine in Checking Malaria by using Chi-square Test.

14. Fit a straight line by the method of least squares to the following data. Assuming that the same rate of change continues, what would be the predicted earnings for the year 2009?

Year	2000	2001	2002	2003	2004	2005	2006	2007
Earnings (Rs. Lakhs)	38	40	65	72	69	60	87	95

15. Calculate the 4-yearly moving averages of the Production figures given below.

Year	Production (in.Tonnes)	Year	Production (in Tonnes)
1993	15	2001	63
1994	21	2002	70
1995	30	2003	74
1996	36	2004	82
1997	42	2005	90
1998	46	2006	95
1999	50	2007	102
2000	56		

16. A. Test were made at short intervals on electric bikes from two manufacturers. The following table gives the number of hours of service given by batteries from two different sources:

X	2400	2100	1900	2200	1800	2500	2300	2500
Y	2600	2400	2200	1800	2100	3000	2800	3000

Do these results indicate a significant difference between the types of batteries with respect to the mean life of batteries were concerned? Use t – test.

17. The life time of electric bulbs for a random sample of 10 from a large consignment gave the following data: 4.2, 4.6, 3.9, 4.1, 5.2, 3.8, 3.9, 4.3, 4.4, 5.6 (in '000 hours). Can we accept the hypothesis that the average life time of bulbs is 4, 000 hours.

SECTION – C

Answer any TWO questions:

(2 x 20 = 40)

18. Calculate seasonal indices from the following data using link relatives method

	I	II	III	IV
2018	45	54	72	60
2019	48	56	63	56
2020	49	63	70	65
2021	52	65	75	72
2022	63	70	84	66

19. Given $r_{12} = 0.78$ $r_{13} = 0.86$ $r_{23} = 0.92$ calculate the following

- (i) $r_{23.1}$
- (ii) $r_{13.2}$
- (iii) $R_{1.23}$
- (iv) $R_{3.12}$

20. In a survey of 200 boys, of which 75 were intelligent, 40 had skilled fathers. While 85 of the unintelligent boys had had unskilled fathers. Do these figures support the hypothesis that skilled fathers have intelligent boys. Use Chi Square test for 1 degree of freedom at 5% level.

21. The following table gives the number of refrigerators sold by 4 Salesman in three months May, June and July

Months	Salesman			
	A	B	C	D
May	50	40	48	39
June	46	48	50	45
July	39	44	40	39

- (a) Is there a significant difference in the Sales made by the four Salesman?
- (b) Is there a significant difference in the Sales made during different months?
