

**B. Sc. DEGREE END SEMESTER EXAMINATION : OCTOBER 2022**  
**SEMESTER 1 : COMPLEMENTARY STATISTICS FOR B. Sc. MATHEMATICS / CA**  
**COURSE : 19U1CPSTA1 / 19U1CRCST1 : DESCRIPTIVE STATISTICS**

(For Regular – 2022 Admission and Improvement / Supplementary - 2021/2020/2019 Admissions)

Time : Three Hours

Max. Marks: 75

**(Use of Scientific calculator and statistical tables are permitted)**

**PART A**

**(Each Question carries 1 mark. Maximum marks from this part is 10)**

1. What is scatter diagram?
2. Define weighted index number?
3. 10 is the mean of a set of 7 observations and 5 is the mean of another set of 3 observations, find the mean of combined set.
4. The standard deviation of  $1, 2, 3, \dots, n$  is  $\sqrt{14}$ ; Find  $n$ ?
5. The mean mark of 100 students was found to be 50. Later on it was found out that a score of 87 was misread as 78. Find the correct mean.
6. Write any two applications of index number?
7. Define Value Index Numbers.
8. If the s.d. of  $x$  is 5, find the s.d. of  $-2x$  ?
9. Find the median and mode of the numbers 25, 1275, 748, 162, 1274, 776, 162, 32?
10. The mean of a distribution is 15 and variance is 25. Also given that  $\beta_1 = 1$ . Find the third moment about origin ?
11. Write the normal equations for fitting a power curve of the form  $y = ax^b$
12. What are the causes for irregular variation?

**PART B**

**(Each question carries 3 marks. Maximum marks from this part is 15)**

13. What are the characteristics of Skewness?
14. What are the uses of moments?
15. Explain how you will use the principle of least squares in fitting of curves?
16. An aeroplane cover the four sides of a square at speeds of 100, 200, 300 and 400 km per hour respectively. What is the average speed of the plane?
17. For the numbers 2, 4, 6, 8, 10 show that  $A.M > G.M. > H.M.$
18. Calculate simple Index number by average price relative method by using both AM and GM.
 

Items	Price in the base year	Price in current year
A	5	7
B	10	12
C	15	25
D	20	18
E	8	7
19. Show that Fisher's Index Number satisfies both time and factor reversal test.

**PART C**

**(Each question carries 5 marks. Maximum marks from this part is 20)**

20. The numbers 3.2, 5.8, 7.9 and 4.5 have frequencies  $x, (x+2), (x-3)$  and  $(x+6)$  respectively. If the arithmetic mean is 4.876, find the value of  $x$ .

21. What is skewness? Distinguish between positive and negative skewness?

22. Calculate the median from the following data

Mearks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80	
No. of students	4	16	40	76	96	112	120		125

23. Fit a straight line by the method of least squares to the following data

Year	2009	2010	2011	2012	2013	2014	2015
profits	300	700	600	800	900	700	1000

24. Fit a trend line to the following data using free hand method

Year:	1991	1992	1993	1994	1995	1996
Profit:	40	42	40	48	52	49

25. What is curve fitting? Explain the method of fitting of the parabola

#### PART D

(Each question carries 10 marks. Maximum marks from this part is 30)

26. Calculate the value of the median, first and third quartiles from the following

Values	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20
frequency	2	5	4	11	11	11	13	10

27. Fit an exponential curve of the form  $y=ab^x$  to the following data

x :	1	2	3	4	5	6	7	8
Y :	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

28. Compute Cost of living index numbers using both the Aggregate expenditure and Family budget method from the following data

Commodity	A	B	C	D	E	F	G	H
Unit consumption in base year	200	50	50	20	40	50	60	40
Price in base year	10	30	40	200	25	100	20	150
Price in current year	12	35	50	300	50	150	25	180

29. From the following distribution, calculate (1) the first four moments about mean (2) skewness based on moments (3) kurtosis

Income	Frequency
0-10	1
10-20	3
20-30	4
30-40	2