'समानो मन्त्रः समितिः समानी'

UNIVERSITY OF NORTH BENGAL

B.Sc. Programme 6th Semester Examination, 2023

DSE1/2/3-P2-STATISTICS

TIME SERIES ANALYSIS

Time Allotted: 2 Hours | Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

1. Answer any ***four*** from the following: 3×4 =12

   (a) What is time series?

   (b) What are the different components of a time series?

   (c) What are the relationship among the different components of a time series?

   (d) What is irregular fluctuations?

   (e) What are the different measures of a trend?

   (f) What are the uses of time series?

GROUP-B

2. Answer any ***four*** from the following: 6×4 = 24

   (a) Explain the necessity of analysing time series data.

   (b) Discuss the merits and demerits of moving average method.

   (c) Reduce the trend equation $y_t = 144 + 8t$ (origin at 1995 and unit of t is 1 year) for yearly totals to quarterly trend equation.

   (d) Discuss the merits and demerits of fitting mathematical curves.

   (e) Explain 'business cycles' and describe a method of isolating the cyclical variation from the time series data.

   (f) Discuss the various uses of seasonal index in time series analysis.

GROUP-C

3. Answer any ***two*** from the following: 12×2 = 24

   (a) Describe the method of moving average and discuss its role in the isolation of trend and in smoothing time series data.

(b) (i) Discuss ratio-to-trend or trend ratio method.

(ii) The number of traffic accidents in Siliguri in four quarters of a year during the period 1997-99 are given below.

Year	Quarters			
	I	II	III	IV
1997	165	135	140	180
1998	152	121	127	163
1999	140	100	105	158

Find seasonal indices by trend ratio method, assuming a linear trend for the data.

(c) (i) Describe the method of mathematical curves for measurement of trend.

(ii) Fit a linear trend to the following data on annual sales of a departmental store and estimate the sale for the year 2007.

Year	1999	2000	2001	2002	2003	2004	2005	2006
Sales	38	40	65	72	69	60	87	95

(d) Describe the process of Exponential smoothing.

——×——