2019

B.Sc. (Hons.)

4th Semester Examination

# STATISTICS

Paper—C10T

Full Marks : 40 Time : 2 Hours

*The figures in the margin indicate full marks.*
*Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any *five* out of *eight* questions : 5×2=10

   (a) Give example of cyclical fluctuation in a time series data.

   (b) When is a time series said to be stationary ?

   (c) Define autocorrelation for stationary process.

   (d) Give a example of a strictly stationary process.

   (e) Define moving average process.

   (f) Derive the condition for stationarity for ARCD model.

*[ Turn Over ]*

(g) Identify the following components of time series :

(i) The rainfall in kolkata that occured for four days in Feburary, 1981 0.5

(ii) Fireloss in a factory. 0.5

(iii) Increase in garment sales in December. 0.5

(iv) General increase in the sale of T.V. sets. 0.5

(h) Give the advantages of Ratio to Trend method over the moving average method for determining seasonal variation.

2. Answer any *four* out of *six* questions : 5×4=20

(a) In case the trend is concave upward, moving average method gives over estimation of trend value—Explain. What happens if the trend is convex upward ? 4+1

(b) Derive the auto correlation function of a stationary AR(1) process.

(c) Desine the coefficcents of AR(2) model using yule-walker equation.

(d) Describe the method of moving average method for obtaining the monthly sales indices of a garment store.

(e) Explain how you can use the ACF and PACF graphically to determine the order of AR and MA processes.

3. Answer any one out of two questions : 1×10=10

(a) Discuss the exponential smoothing method of forecasting from a time series.

(b) Define trend in a time series data.

Show that method of moving average of period k is equivalent to fitting a linear curve through first x points. If a polynomial of order p is fitted through k points what will be the estimated trend ?

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