22STP420

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2024
(Fourth Semester)

Branch – **STATISTICS**

TIME SERIES AND FORECASTING

Time: Three Hours | Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1 In time series analysis, which component represents the long-term movement of the data?
(i) Seasonality (ii) Cyclical variation
(iii) Trend (iv) Irregular variations

2 The model commonly used for modeling the trend component in time series is
(i) ARIMA (ii) Exponential smoothing
(iii) Seasonal decomposition (iv) Holt and Winter

3 Which model is characterized by the linear combination of past error terms?
(i) Autoregressive (AR) (ii) Moving Average (MA)
(iii) Exponential smoothing (iv) Auto Regressive Moving Average

4 The Dickey-Fuller test is used to test ------ in a time series.
(i) Seasonality (ii) Stationarity
(iii) Trend (iv) Autocorrelation

5 A key component in quantitative forecasting is ---------.
(i) Expert opinion (ii) Judgmental adjustments
(iii) Historical data analysis (iv) Market trends

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Discuss first order and second order stationary process.
OR
b Explain the method of least squares to fit a straight line trend.

7 a Explain the concept of simple and weighted moving averages.
OR
b Describe Holt's and Winter's models.

8 a Analyse the first and second order moving average models.
OR
b Explain auto correlation function (ACF).

9 a Explain the key characteristics and properties of Random Walk process.
OR
b Illustrate the Dickey Fuller Test.

10 a Discuss Bayesian information criteria.
OR
b Distinguish between Quantitative and Qualitative methods of forecasting.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Elucidate any two methods of measuring trend in time series.

OR

b Analyse auto-covariance and autocorrelation functions.

12 a Elucidate the various moving averages in time series for smoothing out data.

OR

b Construct the concept of single and double exponential smoothing.

13 a Formulate the ARMA process and its Stationarity and invertibility properties.

OR

b Elucidate Finite order AR(p) and MA(q) models with its properties.

14 a Intrept the non-stationary Time series models in detail.

OR

b Elucidate the basic formulation of ARIMA models and their properties.

15 a Construct the steps involved in stochastic model building.

OR

b Justify the concept of Schwart'z Bayesian Criterion.

Z-Z-Z

END