PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Fourth Semester)

Branch – **STATISTICS**

TIME SERIES AND FORECASTING

Time: Three Hours   Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (10 x 1 = 10)

1   The component having primary use for short-term forecasting is
(i) cyclical variation   (ii) irregular variation
(iii) seasonal variation   (iv) trend

2   An additive model of time series with components, T, S, C and I is
(i) $Y = T \times S \times C \times I$ (ii) $Y = T + S + C + I$
(iii) $Y = T \times S + C \times I$ (iv) $Y = T \times S \times C + I$

3   Simple average method is used to calculate
(i) Trend values   (ii) Cyclic variations
(iii) Seasonal indices   (iv) None of these

4   Which of the following forecasting methods takes a fraction of forecast error into account for the next period forecast?
(i) Simple average method   (ii) Moving average method
(iii) Weighted moving average method   (iv) Exponential smoothing method

5   Autoregressive Moving Average Process is denoted by
(i) ARMA (p,q)   (ii) ARMA (q,p)
(iii) Both ((a) and (b)   (iv) None of the above

6   AR process can be represented by an MA process of
(i) Infinite order   (ii) Finite order
(iii) Both (a) and (b)   (iv) None of the above

7   Test statistics used to test stationary of a time series is
(i) Dickey-Fuller   (ii) Engle-Granger test
(iii) Error correction mechanism   (iv) Augmented Dickey-Fuller test

8   The Box-Jenkins model is a forecasting methodology used to study _____.
(i) Regression   (ii) correlation
(iii) Autocorrelation   (iv) Autoregression

9   The forecasting method is _____.
(i) Cent percent true   (ii) True to a great extent
(iii) Never true   (iv) None of the above

10   There are _____ classes of diagnostic tests, each focusing on a specific dependence structure of a time series.
(i) Two   (ii) Four
(iii) Three   (iv) Five

SECTION - B (35 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 7 = 35)

11 a Explain the Additive and Multiplicative time series model.
OR

b Explain the autocovariance and autocorrelation function.

12 a Explain the concept of Simple Average Method.
OR

b Explain the simple exponential smoothing model and its limitations.

13 a Discuss mixed ARMA models and their properties.
OR

b Explain the estimation of Partial autocorrelation function.

14 a Explain the Random Walk with drift model.
OR

b Explain the Unit Root Tests.

15 a Explain the types of forecasting methods.
OR

b Explain the evaluation metrics to measure performance.

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16 Explain the components of time series.

17 Calculate the seasonal indices for the rain fall (in mm) data in Tamil Nadu given below by simple average method.

Year	Season			
	I	II	III	IV
2001	118.4	260.0	379.4	70
2002	85.8	185.4	407.1	8.7
2003	129.8	336.5	403.1	12.0
2004	283.4	360.7	472.1	14.3
2005	231.7	308.5	828.8	15.9

18 Explain the Second-Order Autoregressive Process with examples.

19 Explain the ARIMA model and their statistical properties.

20 Explain the Qualitative and Quantitative methods in forecasting.

Z-Z-Z   END