

**Disclaimer: The questions given here are indicative of the format of questions in the MCQ section of the end semester exam, and not exhaustive. The final question paper for your exam will be set by the University and will have a wide range of questions. Please use this model paper in conjunction with your other course materials to prepare well for your exams.**

Sl. No.	Question	A	B	C	D	Correct Answer
1	Which of the following is a formal definition of a time series?	A collection of observations at irregular time intervals for a certain variable over a given duration	A collection of observations that has been observed at irregular time intervals for a certain variable over a given duration	A collection of observations that has been observed at regular time intervals for a certain variable over a given duration	A collection of observations at regular and irregular time intervals for a certain variable over a given duration	A collection of observations that has been observed at regular time intervals for a certain variable over a given duration
2	What is the MAIN difference between univariate and multivariate time series analysis?	The number of variables involved	The length of the time series	The type of data involved	The type of analysis conducted	The number of variables involved
3	Which of the following is not a type of data classification based on temporal nature?	Cross sectional data	Time series data	Combination of cross sectional and time series data	Categorical data	Categorical data
4	What type of data is collected at a single point in time on one or more variables?	Time series data	Cross sectional data	Combination of cross sectional and time series data	Multivariate data	Cross sectional data
5	Max Temperature, Humidity and Wind (all three behaviors) in Location (single entity) collected on last day of every year (multiple intervals of time). What kind of data is this?	Time series data	Cross sectional data	Combination of cross sectional and time series data	Neither time series nor cross sectional	Time series data
6	In time series forecasting, what is the primary goal of model evaluation using metrics like Mean Absolute Error (MAE) or Mean Squared Error (MSE)?	To assess model complexity	To compare different datasets	To measure the accuracy of forecasts	To determine the forecast horizon	To measure the accuracy of forecasts
7	Let's say we have monthly sales data for a product. In XYZ forecasting, we would predict that the next month's sales would be the same as the current month's sales. So if the sales for the current month are 1000, we would predict that the sales for the next month will also be 1000. What is XYZ?	Average Forecasting	Moving Average Forecasting	Naive Forecasting	unnaive forecasting	Naive Forecasting
8	In time series data, we cannot simply do a train-test split in the same way we do for other types of data. What is the reason for the same?	The data is very limited	Temporal nature of data	Non-temporal nature of data	No special train-test split is required for time series data	Temporal nature of data
9	Which of the following is not a consequence of long forecasting range?	Decreased Accuracy	Increased Accuracy	Changes in underlying patterns:	Decreased Accuracy	Increased Accuracy
10	Which of the following statements accurately describes the range of a forecast in time series analysis?	The range of a forecast represents the upper and lower limits within which the actual values are expected to fall.	The range of a forecast indicates the time period over which the forecasted values are valid.	The range of a forecast refers to the difference between the highest and lowest observed values in the historical data.	The range of a forecast represents the average deviation between the predicted values and the actual values.	The range of a forecast represents the upper and lower limits within which the actual values are expected to fall.
11	Which type of exponential smoothing is used when the time series data has no trend or seasonality?	Double exponential smoothing	Triple exponential smoothing	Simple exponential smoothing	Holt-Winters model	Simple exponential smoothing
12	What is the formula for simple exponential smoothing?  Ft+1 is the forecasted value for the next period (t+1) Yt is the actual value in the current period (t) Ft is the forecasted value for the current period (t) α is the smoothing factor (0 ≤ α ≤ 1)	$F_{t+1} = \alpha * Y_t + (1 - \alpha) * F_t$	$F_{t+1} = (1 - \alpha) * Y_t + (1 - \alpha) * F_t$	$F_t = (1 - \alpha) * Y_t + (1 - \alpha) * F_{t+1}$	$F_t = (1 - \alpha) * Y_t / (1 - \alpha) * F_{t+1}$	$F_{t+1} = \alpha * Y_t + (1 - \alpha) * F_t$
13	In simple exponential smoothing, what does the smoothing factor α determine?	The weight given to the most recent observation	The weight given to past observations	The forecasted value for the next period	The actual value in the current period	The weight given to the most recent observation
14	Double exponential smoothing is also known as:	Holt's method	Simple exponential smoothing	Triple exponential smoothing	Holt-Winters model	Holt's method
15	Which forecasting technique extends double exponential smoothing by incorporating seasonality?	Simple exponential smoothing	Holt-Winters model	Holt- Model	Bold model	Holt-Winters model
16	Which of the following assumes trend but assumes no seasonality in the data?	Simple Exponential Smoothing	Double Exponential Smoothing	Holt-Winters Model	Bold model	Double Exponential Smoothing
17	What should be ensured before using an ARMA model for forecasting the future values of a time series?	Non-stationarity of the time series	Lack of significant lags in the data	Stationarity of the time series	No fluctuations in the time series	Stationarity of the time series

18	What method is commonly used to estimate the parameters of an ARMA model?	Maximum likelihood estimation (MLE)	Linear regression	Bayesian inference	Gradient descent	Maximum likelihood estimation (MLE)
19	What is an important step in model diagnostic checking for an ARMA model?	Determining the appropriate order	Analyzing the ACF plot	Assessing the residuals	Calculating forecast accuracy	Assessing the residuals
20	How are forecasted values generated in an ARMA model?	Extrapolating the model using estimated parameters	Using the first observation of the time series	Calculating the mean of the observed values	Applying a random walk algorithm	Extrapolating the model using estimated parameters
21	Forecasted values in an ARMA model are generated by extrapolating the model using the estimated parameters.	a) ACF and PACF	b) AIC and BIC	c) MSE and MAE	d) AR and MA orders	c) MSE and MAE
22	What is the primary difference between ARMA and ARIMA models?	ARIMA models include a differencing component, while ARMA models do not.	ARIMA models include a moving average component, while ARMA models do not.	ARIMA models are used for stationary time series, while ARMA models are used for non-stationary time series.	There is no significant difference between ARMA and ARIMA models.	ARIMA models include a differencing component, while ARMA models do not.
23	What do the parameters P, D, and Q represent in the ARIMA(P, D, Q) model?	P represents autoregressive order, D represents differencing order, and Q represents moving average order.	P represents moving average order, D represents autoregressive order, and Q represents differencing order.	P represents differencing order, D represents autoregressive order, and Q represents moving average order.	P represents autoregressive order, D represents moving average order, and Q represents differencing order.	P represents autoregressive order, D represents differencing order, and Q represents moving average order.
24	What is the purpose of differencing in the ARIMA model?	To capture short-term fluctuations and dependencies in the time series.	To eliminate trends and seasonality in the time series.	To incorporate the relationship between the current observation and its lagged values.	To incorporate the relationship between the current observation and its lagged values.	To eliminate trends and seasonality in the time series.
25	What are AIC and BIC used for in model selection?	Assessing the model's goodness of fit.	Evaluating the complexity of the model.	Comparing and selecting the best-fitting model.	All of the following: Assessing the model's goodness of fit. Evaluating the complexity of the model. Comparing and selecting the best-fitting model.	All of the following: Assessing the model's goodness of fit. Evaluating the complexity of the model. Comparing and selecting the best-fitting model.
26	Which criterion places a stronger penalty on model complexity?	AIC	BIC	TIC	NIC	BIC
27	Which of the following is NOT a characteristic of time series data?	interval of recording data can vary across the range	interval of recording data must remain same	the interval and sequence of data cannot be changed	the sequence of data cannot be changed	interval of recording data can vary across the range
28	Which forecasting technique can you strongly recommend for forecasting the wollen jackets in India	Moving average forecasting model	Exponential Moving Average model	Naïve forecasting model	Additive Decomposition model	Additive Decomposition model
29	Monthly shoe sales in 1000 pairs are recorded from Jan 2020 to Jun 2022. The first 12 observations are 9.4, 10.3, 12.5, 10.1, 11.2, 14.5, 18.3, 15.6, 13.8, 10.7, 8.0, 6.5. What is the quarterly moving average for first 4 quarters?	Q1 - 10.73, Q2 - 11.73, Q3 -15.9, Q4 - 8.4	Q1 - 10.73, Q2 - 11.93, Q3 -16.9, Q4 - 8.4	Q1 - 10.73, Q2 - 11.93, Q3 -15.9, Q4 - 8.4	Q1 - 11.73, Q2 - 11.93, Q3 -15.9, Q4 - 8.4	Q1 - 10.73, Q2 - 11.93, Q3 -15.9, Q4 - 8.4
30	Which of the following is the correct statement about moving average forecasting technique?	Moving average forecasting captures median of the data	Moving average forecasting captures trend in the data	Moving average forecasting captures the random variations in the data	Moving average forecasting captures the seasonal variations in the data	Moving average forecasting captures trend in the data