

CUET Applied Mathematics Test - Set 31

Unit V: Time Based Data (Intermediate to Advanced)

General Instructions

1. Total Questions: **15**
2. Duration: **60 Minutes**
3. All questions are compulsory.
4. Each question carries **5 marks**.
5. For each correct answer: **+5 marks**.
6. For each incorrect answer: **-1 mark**.
7. No negative marking for unanswered questions.
8. Use of calculator or electronic devices is strictly prohibited.
9. Choose the most appropriate answer from the given options.

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1. In a 3-year moving average, the weight assigned to each observation in the window is equal. If we use a weighted moving average with weights 1, 2, 1 for a 3-year period, the smoothed value for Y_t is:
 - (A) $(Y_{t-1} + Y_t + Y_{t+1})/3$
 - (B) $(Y_{t-1} + 2Y_t + Y_{t+1})/4$
 - (C) $(Y_{t-1} + 2Y_t + Y_{t+1})/3$
 - (D) $(Y_{t-1} + Y_t + Y_{t+1})/4$
2. If the trend equation is $Y = 50 + 2X$ with origin at 2018 and X unit = 1 year, what will be the new equation if the origin is shifted to 2021?
 - (A) $Y = 56 + 2X$
 - (B) $Y = 44 + 2X$
 - (C) $Y = 50 + 2(X + 3)$
 - (D) $Y = 50 + 6X$
3. A time series data shows a periodic fluctuation every 7 days. This variation is classified as:
 - (A) Secular Trend
 - (B) Cyclical Variation
 - (C) Seasonal Variation
 - (D) Irregular Variation
4. The method of semi-averages assumes that the trend is:
 - (A) Exponential
 - (B) Parabolic
 - (C) Linear
 - (D) Periodic
5. In the multiplicative model $Y = T \cdot S \cdot C \cdot I$, the components S, C , and I are usually expressed as:
 - (A) Absolute values
 - (B) Percentages or Ratios
 - (C) Logarithmic values
 - (D) Square roots
6. When calculating the trend using the method of least squares for $n = 9$ years, if the middle year is 2015, what is the value of X for the year 2012?
 - (A) -2
 - (B) -3
 - (C) 3
 - (D) 0
7. Which of the following is a disadvantage of the moving average method?
 - (A) It is highly subjective
 - (B) It cannot be used for non-linear trends
 - (C) It results in the loss of data at the beginning and end of the series
 - (D) It is very complex to calculate
8. If the seasonal index for Quarter 1 is 85, it indicates that the value for this quarter is:
 - (A) 85% above the average
 - (B) 15% below the average
 - (C) 15% above the average
 - (D) Fixed at 85 units
9. For a 4-year moving average, centering is required because:
 - (A) The average does not coincide with a specific time period

- (B) The trend is non-linear
(C) The data contains too many outliers
(D) To eliminate irregular variations completely
10. The trend equation for the production of a factory is $Y = 120 + 5X + 2X^2$. This represents a:
(A) Linear trend
(B) Exponential trend
(C) Parabolic trend
(D) Periodic trend
11. In the context of Time Series, "Deseasonalized Data" is calculated as:
(A) Original Data + Seasonal Index
(B) (Original Data / Seasonal Index) $\times 100$
(C) Original Data - Trend
(D) Original Data \times Seasonal Index
12. A sudden strike in a factory resulting in a drop in production for two weeks is an example of:
(A) Cyclical variation
(B) Secular Trend
(C) Irregular variation
(D) Seasonal variation
13. If $\sum X = 0$ for $n = 5$, and $\sum Y = 250$, $\sum X^2 = 10$, $\sum XY = 40$, the annual increase in the trend is:
(A) 50 units
(B) 4 units
(C) 10 units
(D) 40 units
14. In a time series with 12 months, the sum of seasonal indices in a multiplicative model should be:
(A) 100
(B) 1200
(C) 1
(D) 0
15. The method of semi-averages is superior to the graphical method because:
(A) It uses all data points equally
(B) It eliminates subjectivity in drawing the trend line
(C) It can predict cyclical fluctuations
(D) It handles irregular variations better

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