



- (iv) Bomb blasts in Gurdaspur.
- (v) An era of prosperity.
- (vi) Decrease in AIDS cases due to awareness.

Give reasons for your answers.

- (b) Explain how you will decide about the different types of mathematical curves to be fitted to a given time series data giving appropriate reasons in each case. (6,7)
2. (a) Describe the Moving Average method for determining trend in a time series. Obtain the trend values for a time series of extent  $m = 2k + 1$  if it consists of a quadratic polynomial in a time variable.
- (b) Describe the appropriate method for obtaining the seasonal component from a given time series of monthly data when the data is known to have prominent business cycles. (6,7)
3. (a) Give the genesis of logistic curve and describe Yule's method for fitting this curve.
- (b) Why can't we measure the random component of a time series? Describe the variate difference method to estimate the variance of the random component of a time series. (6,7)

**SECTION B**

4. (a) What are chance and assignable causes of variability ? What part do they play in the operation and interpretation of a Shewhart control chart ? When is the process said to be in statistical control ?
- (b) Discuss the various control charts for controlling process average and process variability when quality characteristic is a variable. (6,7)
5. (a) What are modified control limits ? How are they derived ? Why is it required to construct modified control limits ?
- (b) What are control charts for attributes ? Derive control charts for controlling the proportion defectives when sample size is variable, giving clearly the statistical concept used. (6,7)
6. (a) Distinguish between :
- (i) ASN and ATI curves
- (ii) AQL and LTPD
- (b) Obtain OC, ATI and AOQ functions for a single sampling plan for attributes. Discuss the average quality protection approach to decide the sample size and acceptance number with respect to this plan. (6,7)

**SECTION C**

7. (a) Write a short note on C.S.O highlighting its main functions and major publications.

- (b) (i) Describe two methods of collecting data in a population census.
- (ii) What are the two heads under which the 'Statistics of Industrial Production' is collected in India ?
- (iii) At the national level, which organization is responsible for co-ordination of statistics ? (4,6)