

**2025/FYUG/ODD/SEM/
STADSC-301T/043**

FYUG Odd Semester Exam., 2025

STATISTICS

(5th Semester)

Course No. : STADSC-301T

(Applied Statistics)

Full Marks : 70

Pass Marks : 28

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

Answer any *two* of the following questions :

$2 \times 2 = 4$

- (a) What do you mean by Statistical Quality Control?
- (b) What do you understand by $3\text{-}\sigma$ control limits of a control chart?
- (c) What is a control chart?

(2)

2. Answer any one of the following questions :

- (a) (i) Explain the terms 'chance causes of variation' and 'assignable causes of variation'.
- (ii) Explain in detail $\bar{X}$ and R charts and obtain their control limits.
- (b) (i) Distinguish between process and product control.
- (ii) Distinguish between defect and defectives. Give some examples of defects for which C-chart is applicable. How do you calculate control limits for a C-chart?

UNIT—II

3. Answer any two of the following questions :

2×2=4

- (a) Define rates and ratios of vital events.
- (b) "Crude death rate is not a probability rate." Why?
- (c) Define infant mortality rate.

(3)

4. Answer any one of the following questions : 10

- (a) What is a life table? What are the basic assumptions in its construction? Explain the various columns of a life table and the relation between them. Also write the uses of a life table.

$$1+2+4+3=10$$

- (b) Define Gross and Net Reproduction Rate. Show that $NRR \leq 1$. Interpret the results $NRR \approx 1$.

$$3+3+2+2=10$$

UNIT—III

5. Answer any two of the following questions :

2×2=4

- (a) What do you mean by seasonal variation in a time series? Explain with an example.
- (b) Write the uses of time series.
- (c) Which component of time series is applicable in the following cases?
- (i) Fire in a factory
- (ii) Sale in market during festival

(4)

6. Answer any one of the following questions :

- (a) (i) Explain semi-average method of determining trend. Write its merits and demerits. 10
(ii) What do you mean by additive and multiplicative models in time series? 5
- (b) (i) Explain the moving average method of trend determination in time series analysis. 5
(ii) Explain the fitting of a straight line by least squares method. Write the merits and demerits of trend fitting by the principle of least squares. 5

UNIT—IV

7. Answer any two of the following questions :

2×2=4

- (a) Explain the simple average method for measuring seasonal variation.
- (b) Explain deseasonalization of data.
- (c) Briefly discuss the 'residual approach' of measuring cyclic movement in a time series.

(5)

8. Answer any one of the following questions : 10

- (a) (i) Discuss link relative method for measuring seasonal fluctuation in time series with its merits and demerits. 5
(ii) Explain ratio to moving average method for determining seasonal index with its merits and demerits. 5
- (b) (i) Describe the ratio to trend method with its merits and demerits. 5
(ii) Explain in detail a sophisticated method of determining the cyclical component of a time series. 5

UNIT—V

9. Answer any two of the following questions :

2×2=4

- (a) "Index numbers are economic barometers." Explain.
- (b) How do you select the base period for an index number?
- (c) Give the steps in the construction of chain base index number.

10. Answer any *one* of the following questions :

- (a) (i) Define an index number. Discuss the problems involved in the construction of an index number. 1
- (ii) Show that Fisher's index number satisfies the time reversal test and factor reversal test. 4
- (b) (i) What is consumer price index number? Describe the main steps involved in the construction of consumer price index number. 6
- (ii) What are chain base index numbers? How are chain base index numbers converted into fixed base index numbers? 4

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