

STATISTICS (31)

Scheme of valuation

SECTION - A · IPVC

I.

- 1) Registration Method.
- 2) Base year price
- 3) Irregular variation
- 4) Missing value
- 5) Leptokurtic.

IM

IM

IM

IM

IM

II 6) a) Mortality & Survival pattern.

IM

b) Free of bias.

IM

c) within one year

IM

d) PQ

IM

e) Standard Normal ~~distribution~~ ^{distribution}

IM

III

7) ASDR.

IM

8) ~~proportion of quality~~ ^{quality}

IM

9) moving average method

IM

10) $P > 0.5$

IM

11) Normal distribution

IM

IV₁₂) Probability that a person of age 'x' survives up to age 'x+1' 1M

13. $P_{01} \times P_{12} \times P_{20} = 1$ 1M

14. Seasonal variations. 1M

15. No of printing mistakes per page in a text book (Any) 1M

16. 0.9973

SECTION - B

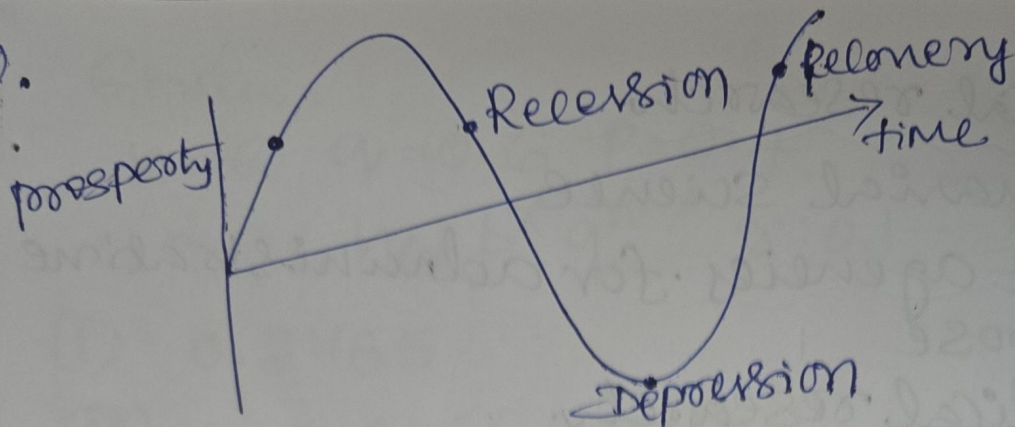
17. a) It is used in life Insurance Company.
b) Estimating future population
c) used by Govt & private organizations in planning health care. 2M
d) used for the measurement of growth of population in the computation of NRR. (Any two)

18. a) Defining purpose and scope
b) Conducting family Budget enquiry and selecting the weights 2M
c) obtaining price quotations
d) Computing the index number (Any 2)

19. $P_{01}^F = \sqrt{\frac{I_a}{P_{01}} \times P_{01}^{Pa}}$ 1M

$\frac{I_a}{P_{01}} = 86.4$ 1M

20.



2M

21.

a) There will be no Continuous missing values in the series.

b) There are no sudden jumps in the value of Y from one period to another.

c) There is a sort of uniformity (Ans 2)

2M

22.

$$P=0.5 \text{ \& } n=8$$

2M

$$PMF + \lambda = 3$$

2M

23.

24

$$S.D = \sqrt{\frac{n}{n-2}} + 1.4142 (\text{Ans})$$

2M

Section-C

25.

TFR + ASFR formula.

2M

ASFR: 27.15, 82.19, 96.19, 42.17, 30

1M

$$12.82, 11.43 = 301.95$$

TFR (Answer) + Comment
1509.75

2M

26. a) i) medical research
 ii) actuarial science
 iii) Govt agencies for administrative purpose 2M
 iv) medical research.
 v) ~~medical~~ demographic research. (any 2)
 b) Formula + 9(Ans) 2M
 c) Expected no of years that a new born baby would live 1M

27. Formula. 1M
 $q_0: 20, 5, 3, 4, 6, 9$ 1M
 $\sum p_0 q_0 = 527 \neq \sum p_1 q_0 = 979$ 2M

$$CPIN_{AEM} = 185.76$$
 1M

28. 3YMT: 50, 55, 60, 68, 77, 87, 98, 109. 1M
 3YMA: 16.67, 18.33, 20, 22.67, 25.67, 29, 32.67 2M
 36.33
 Comment + position 2M

29. Difference Table $\rightarrow 1, 3, -1 \neq 0$ 2M
 $X = 1.5$ 1M
 Newton's formula upto Δ_0^4 1M
 Ans:- 44.6875 1M

30. Given $n=6$ $q=0.6$ $p=0.4$ $P(X) = {}^n C_x p^x q^{n-x}$ $x: 0, 1, \dots, n$ (i) 0.2465 (ii) $1 - 0.0466 = 0.9533$	1M 1M 1M 2M
31. $a=4$, $b=7$ & $n=5$ Mean formula + 1.8182 (Ans) SD formula + 0.8331	1M 2M 2M
32. WGM formula $P_0 = An \left(\frac{\sum w \log P}{\sum w} \right)$ $P = \frac{P_1}{P_0} \times 100$ $\log p: 2.2631, 2.3010, 2, 2, 2.2219$ $w \log p: 56.5775, 23.0100, 37.1565, 20, 111.0950$ Ans:- 179.1	2M 1M 1M 1M
33. $\sum Y = 66$, $\sum X^2 = 70$ $\sum XY = 10$ $\left[a = \frac{\sum Y}{n} + 11 \text{ (Ans)} \right] + \left[b = \frac{\sum XY}{\sum X^2} + 0.143 \text{ (Ans)} \right]$ The fitted straight line trend equation is $Y = 11 + 0.143X$	2M 4M 1M

34.

$$n=5$$

$$Y_5 - 5Y_4 + 10Y_3 - 10Y_2 + 5Y_1 - Y_0 = 0$$

$$Y_3 = 284.5$$

$$Y_6 - 5Y_5 + 10Y_4 - 10Y_3 + 5Y_2 - Y_1 = 0$$

$$Y_6 = 865$$

35.

Given

$$\text{Mean} = \mu = 100$$

$$\text{variance} = \sigma^2 = 9$$

$$\sigma = 3$$

$$Z = \frac{X - \mu}{\sigma} = \frac{X - 100}{3}$$

$$(i) P(0 < Z < 1) = 0.5 - 0.1587 = 0.3413$$

$$(ii) P(Z < 1.33) = 1 - 0.0918 = 0.9082$$

SECTION-D

VIII

36.) StDR formula for locality A & B $\rightarrow$ IM

ASDR formula $\rightarrow$ IM

$$A: 28, 4.16, 5.33, 37.5 \rightarrow \text{IM}$$

$$B: 36.25, 5.45, 6.43, 36.67 \rightarrow \text{IM}$$

$$\Sigma p = 36,800 \rightarrow \text{IM} \quad \Sigma PA: 419870 \rightarrow \text{IM} \quad \Sigma PB: 489780 \rightarrow \text{IM}$$

$$StDRA = 11.66 \rightarrow \text{IM}$$

$$StDRB = 13.6 \rightarrow \text{IM}$$

Comment:- City A is more healthier than City B $\rightarrow$ IM

$$37). \left. \begin{array}{l} \Sigma q_1 P_0 = 360 \quad \Sigma q_1 P_1 = 410 \\ \Sigma q_0 P_0 = 330 \quad \Sigma q_0 P_1 = 390 \end{array} \right\} 4M$$

$$P_{01}^{ME} + 106.94 \rightarrow 2M$$

~~$$P_{01}^{ME} + 106.94 \rightarrow 2M$$~~

$$q_{01}^F + 107.09 \rightarrow 2M$$

$$39 \quad \left. \begin{array}{l} n=6, \Sigma X^2=70 \quad \Sigma \log Y = 6.9577 \\ \Sigma X \log Y = 2.5629 \end{array} \right\} 3M$$

$$\log a: 1.1596 + a = 14.44 \rightarrow 3M (1+1+1)$$

$$\log b: 0.0366 + b = 1.087 \rightarrow 3M$$

$$\text{Fitting equation: } Y = (14.44)(1.087) - \text{IM}$$