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SL = 14

Ans to the Q. No.-1

Year	Income	3 Year semi total	3 Year semi Avg.	Trend Value
2008	43			$52.67 - 10.55 = 42.11$
2009	51	158	52.67	$42.11 + 10.55 = 52.67$
2010	64			$52.67 + 10.55 = 63.22$
2011	76			$63.22 + 10.55 = 73.77$
2012	81	253	84.33	$73.77 + 10.55 = 84.32$
2013	96			$84.32 + 10.55 = 94.87$

now,

Difference between the central Year :- 2012 - 2009
= 3

Difference between the semi-avg = $84.33 - 52.67$
= 31.66

∴ Increase in trend value for one year, $\frac{31.66}{3}$

$$\begin{bmatrix} 5000.0 & 5000.0 \\ 5000.0 & 8000.0 \end{bmatrix} = 10.55$$

22222.0 is additional amount

Ans to the Q. No:- 2

3-Year Moving Average,

Year	Loan	3-Year Semi total	3-Year nomi average
2004	40	- - -	- - -
2005	42	22 + 12 +	40.33
2006	39	106	35.33
2007	25	71	30.73
2008	27	103	34.33
2009	51	106	35.33
2010	23	105	35
2011	26	85	28.33
2012	31	87	29
2013	30	109	36.33
2014	48	- - -	- - -

Ans to the Q.No:-03

The transition Probability matrix

$$P = \begin{bmatrix} P_{00} & P_{01} \\ P_{10} & P_{11} \end{bmatrix} = \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix}$$

We need P_{00}^5 in P^5

$$P^2 = \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix} \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix}$$

$$= \begin{bmatrix} 0.68 & 0.32 \\ 0.64 & 0.36 \end{bmatrix}$$

$$P^4 = \begin{bmatrix} 0.68 & 0.32 \\ 0.64 & 0.36 \end{bmatrix} \begin{bmatrix} 0.68 & 0.32 \\ 0.64 & 0.36 \end{bmatrix}$$

$$= \begin{bmatrix} 0.6672 & 0.3328 \\ 0.6656 & 0.3344 \end{bmatrix}$$

$$P^5 = \begin{bmatrix} 0.6672 & 0.3328 \\ 0.6656 & 0.3344 \end{bmatrix} \begin{bmatrix} 0.6 & 0.4 \\ 0.8 & 0.2 \end{bmatrix}$$

$$= \begin{bmatrix} 0.66656 & 0.33344 \\ 0.66688 & 0.33312 \end{bmatrix}$$

The required probability is 0.66656

Ans to the Q.No:- 4 of m

i) more than 1 minutes,

$$P(T > 1) = e^{-\lambda t} = e^{-2 \times 1} = 0.1353.$$

" more than 2 minutes,

$$P(T > 2) = 1 - e^{-\lambda t} = 1 - e^{-4} = 0.98168.$$

ii) between 1 to 2 minute,

$$P(1 < T \leq 2) = e^{-\lambda t_1} - e^{-\lambda t_2} = e^{-2 \times 1} - e^{-2 \times 2} = 0.1353 - 0.0133 = 0.122.$$

$$= e^{-2} - e^{-4} = 0.1353 - 0.0133 = 0.122.$$

$$= 0.1333 - 0.0133 = 0.117.$$

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