

13.(a) Write an explanatory note on the following :

- (i) De - Moivre's law of mortality.
- (ii) Makeham's law of mortality.

(OR)

(b) Derive the following relations :

$$(i) \quad m_x = \frac{l_x - l_{x+1}}{L_x}$$

$$(ii) \quad L_x \simeq \frac{l_x + l_{x+1}}{2} .$$

Register Number :

Name of the Candidate :

2 1 8 8

P.G. DIPLOMA EXAMINATION, 2008

(ACTUARIAL STATISTICS)

(PAPER - I)

110. BASIS OF ACTUARIAL SCIENCE

May]

[Time : 3 Hours

Maximum : 100 Marks

SECTION - A (5 × 8 = 40)

Answer any FIVE questions.

All questions carry equal marks.

1. Find the accumulated value of principal of Rs. 400/- invested for 5 years at compound interest of 6 % per annum.
2. What do you mean by varying rate of interest ?
3. Explain the following terms :
 - (i) Net premium.
 - (ii) Pure premium.

Turn over

4. Write a critical note on optimal insurance.
5. Explain models for individual claim random variables.
6. Examine stop - loss insurance coverage.
7. State the properties of survival function.
8. Derive the relation between the survival function and life - table functions.

SECTION - B (5 × 12 = 60)

Answer ALL questions by choosing

either (a) or (b).

Each question carries TWELVE marks.

9. (a) Derive the formula for accumulated value of a unit money invested at compound interest i per annum.
(OR)
- (b) A sum of money is invested at 4 % p.a. How long it will take to double itself?
10. (a) Write a detailed note on the elements of insurance.

(OR)

- (b) Define an exponential utility function. Also, derive its properties.

11. (a) Discuss the salient features of the individual risk model.

(OR)

- (b) Obtain the mean and variance of the claim random variables were $q = 0.05$ and the claim amount random variable B is uniformly distributed between 0 and 20.

12. (a) Explain the following :

- (i) Time - until - death for a person age x .
- (ii) Curate - future life time.

(OR)

- (b) Suppose that the force of mortality for a survival model is given by the formula.

$$\mu(x) = \frac{0.9}{90 - x} \quad \text{for } 0 \leq x < 90$$

calculate the survival function.

Turn over