PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCom DEGREE EXAMINATION MAY 2024
(Fifth Semester)

Branch – COMMERCE (BUSINESS ANALYTICS)

ACTUARIAL STATISTICS

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (5 x 1 = 5)

1. The accumulated value at the end of the further period of n years is _____

   a) $(1 + i)^m (1 + i)^n$ b) $(1 - i)^m (1 - i)^n$ c) $(1 + i)^n$ d) $(1 + i)^{-n}$

2. The present value of increasing perpetuity due is _____.

   a) d^2 b) $\frac{1}{d^2}$ c) d^{-2} d) $\frac{1}{d^{-2}}$

3. All mortality tables may not start with age _____.

   a) 1   b) –1   c) 0   d) ∞

4. The benefit is payable only at the time of death is _____ assurance.

   a) Whole life   b) temporary   c) term   d) pure

5. The amount of premiums received at the inception will be _____.

   a) P_x b) i_x c) $P_x l_x$ d) l_x

SECTION – B (15 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks   (5 x 3 = 15)

6. a) Find the present value at rate of interest 7% p.a of Rs. 500 payable at the end of 4 years and 3 months

   (OR)

   b) Explain nominal and effective rate of interest.

7. a) Show that $\frac{a_{\overline{6n}}}{a_{\overline{3n}}} = 1 + v^{3n}$

   (OR)

   b) Derive the present value of a deferred annuity

8. a) Find the probabilities that a life aged 35 will not die between 45 and 50.

   (OR)

   b) Explain aggregate table

9. a) Explain term Assurance.

   (OR)

   b) Explain Whole Life Assurance.

10. a) Obtain the present value of an annuity due Rs. 1 per annum for life

    (OR)

    b) Explain temporary immediate life annuity.

SECTION -C (30 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks   (5 x 6 = 30)

11. a) Find (i) the rate of discount corresponding to a rate of interest 0.06 and (ii) the rate of interest corresponding to a rate of discount of 0.08.

(OR)

b) Explain discount and discount value.

12. a) Find the present value and accumulated value of annuity due Rs. 1 p.a for n years under which payments are made $'p'$ times a year, the rate of interest being Rs. 1 p.a.

(OR)

b) A purchaser of an irredeemable debenture gets a divided of 3% every half-year. What should be the purchase price in order to yield an effective rate of 8% p.a?

13. a) Explain the stages involved in construction of mortality table.

(OR)

c) Find the probability that the joint lives (x) and (y) will fail in the $(t + 1)^{th}$ year .

14. a) Explain deferred temporary assurance and increasing temporary assurance.

(OR)

b) The following particulars are given.

x	25	26	27	28	29	30
l_x	97380	97088	96794	95496	96194	95887
d_x	292	294	298	302	307	313

15. a) Derive the mathematical expressions for level annual premium under various plan from sum assured of Rs. 1.

(OR)

b) Derive the expression for $a_{x:\overline{n}}$.

Z-Z-Z   END