K22U 0155

Reg. No. : .....

Name : .....

VI Semester B.Sc. Degree (CBCSS – Supple./Improv.) Examination, April 2022
(2016 – 2018 Admissions)
CORE COURSE IN STATISTICS
6B13STA : Actuarial Statistics

Time : 3 Hours Max. Marks : 48

Instruction : ***Use*** *of calculators and Statistical tables are* ***permitted.***

PART – A

Short answer. Answer **all** the **6** questions.

1. Name different population projection models.
2. Define demography.
3. How does unitised insurance policies differ from traditional insurance policies ?
4. Why premiums are payable in advance ?
5. Define $\ddot{a}_{x:\overline{n}|}$.
6. State the principle of equivalence. **(6×1=6)**

PART – B

Short essay. Answer **any 7** questions.

7. Write a short note on various specific rates.
8. Define life insurance.
9. Distinguish between life insurance and disability insurance.
10. Write a brief note on trauma insurance.

P.T.O.

11. On the basis of a certain mortality table and interest at 4% p.a. effective. Given that $\ddot{a}_{40} = 16.28326$, $p_{40} = 0.9545$, $p_{41} = 0.9425$. Calculate $\ddot{a}_{42}$.
12. The amounts for a certain sum with compound interest at a certain rate in two years and in three years are Rs. 8,820 and Rs. 9,261 respectively. Find the rate and sum.
13. a) Calculate $s_{\overline{10}|}$ if i=5%
    b) Calculate $a_{\overline{5}|}$ if i = 4%.
14. Discuss briefly about housing loans.
15. Establish the relationship between nominal rate of interest and effective rate of interest. **(7×2=14)**

PART – C

Essay. Answer **any 4** questions.

16. Briefly explain the concept population pyramid.
17. What are the sources of information available to build a country's population model ?
18. a) Describe contingent payment.
    b) Assuming an effective rate of interest of 4% per annum and that the probability that you survive t years from now is 0.99^t. Calculate the E.P.V. of a payment of Rs. 25,000 twelve years from now if you are alive then.
19. A life insurance company uses the following assurance to calculate the premium, payable annually in advance for a whole life insurance policy under which the sum insured is payable at the end of the year of death. Calculate the annual premium for a policy with sum assured 250000, when $\mu = 0.04$ and $\delta = 0.08$.
20. Explain the various traditional life insurance policies.
21. Define general insurance. What are the characteristics of general insurance policies ? **(4×4=16)**

PART – D

Long Essay. Answer **any 2** questions.

22. Define life table. Explain and formulate various columns of life table.
23. Explain the role of actuaries in life insurance.
24. A loan of Rs. 16,000 is repayable by ten equal annual payments. The annual effective rate of interest is 4%. Calculate :
    a) The annual installment
    b) The capital element of the 7^{th} payment
    c) The interest element of the 4^{th} payment
    d) The total interest paid over the whole loan.
25. Explain the following :
    a) Fixed interest bonds.
    b) Annuity payable monthly in arrear.
    c) Present value of an immediate perpetuity.
    d) Accumulated value of an immediate annuity. **(2×6=12)**