END TERM EXAMINATION

FIFTH SEMESTER [BCOM(HONS)] JANUARY 2024

Paper Code: BCOM-311   **Subject: Basics of Actuarial Science**

Time: 3 Hours   **Maximum Marks: 75**

Note: Attempt any five questions. Log tables or present value tables should be provided by the examination center. Further, simple calculator (non-scientific) should be permitted.

Q1
a) What do you mean by time value of money? Explain. **(8)**
b) Calculate the accumulated amount of Rs. 2725 deposited with a bank (interest rate being 12% p.a.) for 5 years. Assume that the interest is compounded semi-annually. **(7)**
Note: You can use the following if you need: log 1.06 = 0.0253; log 1.12 = 0.04922, Antilog (0.253) = 1.7906, Antilog (0.4922) = 3.1059.

Q2 Mr. A owes Rs. 2000 due in 2 months, Rs. 1,000 due in 5 months, and Rs. 1,800 due in 9 months. He wants to pay his obligations in two equal instalments due in 6 months, and 12 months respectively. Find the equal payments if money is worth 6% simple interest and at the end of 1 year is the agreed focal date. **(15)**

Q3
a) What is two state model? How is it used to calculate probabilities? **(10)**
b) There is 0.15 probability that a plant will fail. What is the probability that the plant will be in working condition at the end of 6 years? **(5)**

Q4 How will you determine the present value of an ordinary annuity? Your answer should give a mathematical derivation of the same. **(15)**

Q5 What is a life a table? Explain its various components including the curtate life expectancy and complete life expectancy. **(15)**

Q6 Fill the blanks of the life table. Your workings should be clear. **(15)**

Age	l_x	d_x	q_x	p_x
25	1000000	...	0.00409	...
26	...	...	0.00370	...
27	...	...	...	0.99654
28	...	...	...	0.99658
29	...	...	0.00342	...

Where
l_x = Number of lives
d_x = Number of deaths
q_x = Probability of death
p_x = Probability of survival

P.T.O.

Q7 How will you simulate or perform of the following?
a) Projection of death. **(5)**
b) Projection of insurance claim. **(5)**
c) Projection of reserves. **(5)**

Q8
a) What is EMI? How would you calculate EMI? **(8)**
b) Mr. A borrowed Rs. 5,000 from a bank at 12% p.a. He is required to pay the loan in 12 instalments. Calculate the amount of each instalment **(7)**

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