

Maharaja Agrasen Institute of Management Studies

BBA (B&I) - I semester.

Subject: Financial Mathematics (105)

Second Internal Exam

Max. Marks- 40

Time: 2 hrs.

Attempt four questions. Question one is compulsory. Simple calculator and usage of tables are allowed. Write your roll number on question paper

Q-1 (a.) Explain the various method of rate making in insurance.

(b.) Define the term Annuity. Explain the various types of annuities.

~~Q-2~~ (a) A machine, the life of which is estimated to be 15 years, cost Rs. 40,000. Calculate the scrap value at the end of its life, depreciation on the diminishing balance system being calculated at 10% per annum

~~(b.)~~ which is better investment, 6.2% compounded semi annually or 6% compounded monthly?

Q-3 A debt of Rs. 30,000 which is due in 6 years from now is to repaid by three payments. Rs. 5,000 now, Rs. 15,000 in 3 years and a final payment at end of 5 years. If the interest rate is 6% compound annually, how much is the final payment?

Q-4 (a) A company borrows a loan of Rs. 4,00,950 on condition to repay it with compound interest at 6% per annum by annual payment of Rs.1,50,000 each. In how many years will the debt be paid off?

(b) An annuity payable for 15 years certain, the first payment falling due at the end of first year. The annuity is payable at the rate of Rs. 200 per annum during the first 10 years and Rs. 300 per annum during the remaining 5 years. Calculate the present value of the annuity on the basis of interest at 7% per annum.

~~Q-5~~ (a) Complete the mortality table.

x	lx	dx	qx	px
20	10,00,000		0.005	
21			0.0045	
22				0.996
23				0.9965
24				0.997
25			0.0025	

$400950 = 150000 \text{ sum}$   
 $\text{see below}$

~~(b.)~~ Explain the functions present in mortality table.

~~Q-6~~ Calculate on the basis of mortality table given below, Net Annual Premium at 4% rate of interest for a five year endowment assurance of Rs. 1,000 for a person aged 60 years.

Age	60	61	62	63	64	65
Number of living	1,000	980	958	933	900	860
Number of dying	20	22	25	33	40	45

$S (d_n v + d_{n+1} v^2 + \dots)$   
 $\frac{d_n}{i}$