Previous pattern (Total Marks:15)
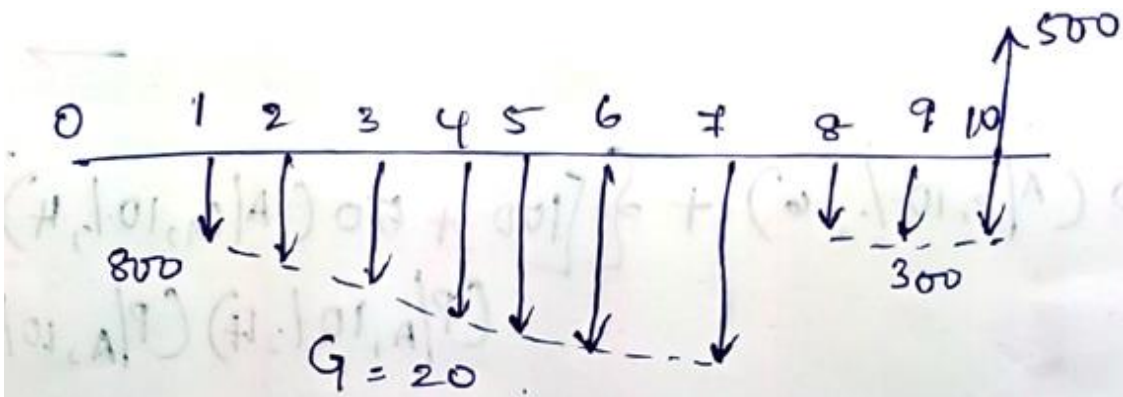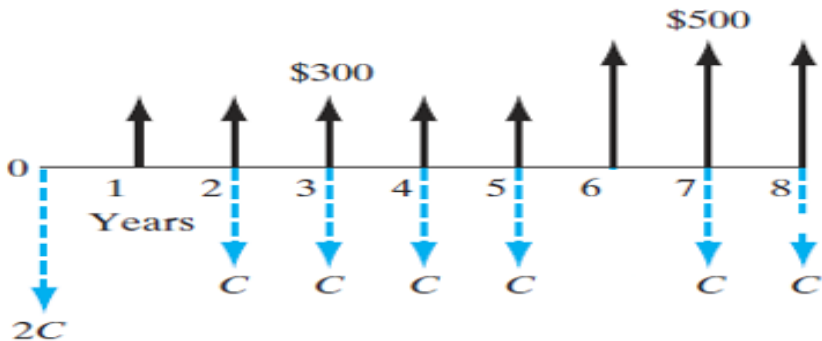
SUBJECT: EEFM

1	A man loans Rs. 1,87,400 from a bank with interest rate at 5% compounded annually. He agrees to pay his obligations by paying 8 equal annual payments, the first being due at the end of 10 years. Find the annual payments
	   a) 43,600.10
	   b) 43,489.47
	   c) 43,263.91
	   d) 43,763.20
		0.5

2	An automobile bought today has a free maintenance for the next two years, after which you are expecting a maintenance cost Rs.10,000 till the end of 10 years. The equivalent total value of maintenance cost now is closest to? (Assume i= 10%)
	   a) 42,345
	   b) 44,091
	   c) 45,534
	   d) 48,980
		0.5

3	For the series of cash deposits and withdrawal shown in the cash flow diagram below, the equation to calculate the future accumulated balance amount at the end of fourth year is:
	
	   a) F = [{5500 + 500 (A/G, 10%, 4)} – {500 + 500 (A/G, 10%, 4}] (F/A, 10%,4)
	   b) F = {5500 - 500 (A/G, 10%, 4)} – {500 + 500 (A/G, 10%, 4}
	   c) F = [{5500 - 500 (A/G, 10%, 4)} – {500 + 500 (A/G, 10%, 4}] (F/A, 10%, 3)
	   d) F = {5000 - 1000 (A/G, 10%, 4)} (F/A, 10%, 4)
		0.5

4	A manufacturing company borrows $100,000 with a promise to repay the loan with equal annual payments over a 5-year period. At an interest rate of 10% per year, the annual payment will be closest to:
	   a) $23,620
	   b) $29,700
	   c) $26,380
	   d) $31,800
		0.5

5	Rubbermaid Plastics Corp. invested $10,000,000 in manufacturing equipment for producing small wastebaskets. If the company uses an interest rate of 10% per year, how much money would it have to earn each year if it wanted to recover its investment in 7 years?
	   a) $3,530,800
	   b) $3,941,800
	   c) $2,054,000
	   d) Over $4,000,000
		0.5

6	You make an equal withdrawal of Rs.1000 for 3 years and from 4th year you increase your withdrawal by an amount Rs. 50 each year for the next 5 years. The interest rate on this amount is 6%. In order to have these withdrawals what is the amount you need to have today? Among the following equations, identify the **correct** one.
	   a) P0 = 1000(P/A,6%,3) + {1050 +50(A/G, 6%, 5)}(P/A,6%,8)
	   b) P0 = 1000(P/A,6%,3) + {1050 +50(A/G, 6%, 5)}(P/A,6%,5)(P/F,6%, 3)
	   c) P0 = 1000(P/A,6%,3) + {1050 +50(A/G, 6%, 5)}(F/A,6%,5)(P/F,6%,7)
	   d) P0 = 1000(P/A,6%,3) + {1050 +50(A/G, 6%, 5)}(P/A,6%,5)(P/F,6%,4)
		0.5

7	The annual equivalent of an income stream of $1000 per year to be received at the end, each of the next 3 years at an interest rate of 10% is:
	   a) $1000 per year
	   b) Less than $1000 per year
	   c) Greater than $1000 per year
	   d) $1000 (A/P, 12%, 3)
		0.5

8	With reference to an arithmetic gradient series, which of the statement is more appropriate?
	   a) Starts at the beginning of the first period and then increases by a constant amount each period.
	   b) Starts at the end of the first period and then increases by a constant amount each period.
	   c) Starts at the end of any period and then increases by a constant amount each period thereafter.
	   d) None of the answers are correct.
		0.5

9	Which of the following statement is true?
	   a) The present value of a uniform series coincides with the first cash flow
	   b) The future value of a uniform series coincides with the last cash flow
	   c) The present value of a uniform series occurs only at zero.
	   d) The future value of uniform cash flow occurs one-time period later than the last cash flow
		0.5

10	A series of uniform deposits 'X' are made starting from first year till 8th year. The equivalent worth of this series at 10th year, at 10% per annum, can be found using:
	
	   a) X (F/A, 10%, 9) (F/P, 10%, 1)
	   b) X (F/A, 10%, 8) (F/P, 10%, 2)
	   c) X (F/A, 10%, 8) (P/F, 10%, 2)
	   d) X (A/F, 10%, 8) (F/A, 10%, 2)
		0.5

11	Vedant Ltd. expects to retire an existing machine at the end of 2023 and will replace it with a new machine for the same task at an estimated cost of INR 8,00,000. The old machine can be sold for INR 50,000 when it is replaced. To provide for replacement, the company deposited the following amounts in an account earning interest at 10%:	2

INR 2,00,000 at the end of 2019

INR 1,50,000 at the end of 2020

INR 1,00,000 at the end of 2021

What additional amount is needed at the end of 2023 to purchase the new machine?

Solution:

$$2L * 1.08^4 + 1.5L * 1.08^3 + 1 * 1.08^2 + X = 8L - 0.5L$$
$$X = 7.5L - (2L * 1.08^4 + 1.5L * 1.08^3 + 1 * 1.08^2)$$
$$X = 7.5L - 5.77695L$$
$$X = 1,72,305$$

12	Reconstruct the following cash flow diagram: A= [800+20(A/G,6%,7)] (P/A,6%,7)(A/P,6%,10)+[300(F/A,6%3)-500](A/F,6%,10). 	2
13	Consider the cash flow shown below. What value of C makes the inflow series equivalent to the outflow series at an interest rate of 10%? 	3

$$2c + c\,(P/A, 10\cdot l, 4)\,(P/F, 10\cdot l, 1) + c\,(P/A, 10\cdot l, 2)\,(P/F, 10\%6)$$

$$= 300\,(P/A, 10\cdot l, 5) + \overset{500}{(P/A, 10\cdot l, 3)}\,(P/F, 10\cdot l, 5)$$

$$5.85\,C = 1907.52$$

$$\boxed{C = 326}$$

| 14 | You plan to invest \$50 now and \$100 at the end of two years, with the investment amount increasing by \$50 per year for the next three years. Determine an annuity payment that is equivalent to this investment plan, with the first payment beginning in year 0 and ending in year 6. Assuming a 10% interest rate. | 3 |
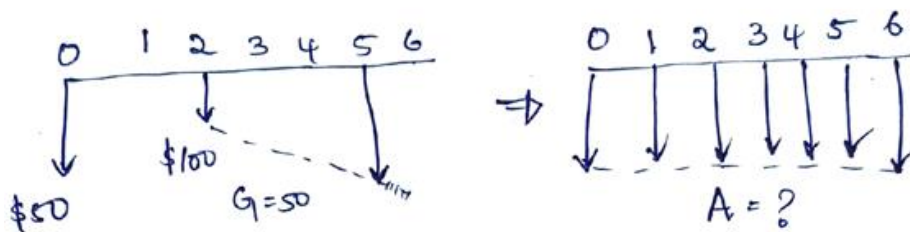
$$50\,(A/P, 10\cdot l, 6) + \left\{ \left[100 + 50\,(A/G, 10\cdot l, 4) \right] \right.$$
$$\left. \cdot (P/A, 10\cdot l, 4)\,(P/A, 10\cdot l, 1) \right\}$$
$$(A/P, 10\cdot l, 6)$$

$$11.48 + \left\{ [100 + 69.05]\; 2.881 \right\}\,(0.2296)$$

$$\boxed{A = \$123.3}$$