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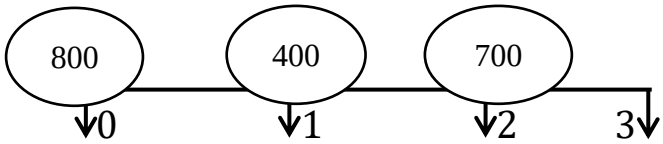
Model Answers of Revision Sheet

1. Single payment: $Fv=PV(1+r/m)^{n*m}$
   $=6{,}000(1+0.08/2)^{2*2}=\$7{,}019$
   Therefore; Collin will be able to pay for the scooter in the future.

2. Perpetuity: for infinite no. of years
   (you have to calculate the CF) $PV_{pep.}=CF/r$
   CF= 2,000,000*9.5% = $190,000

3. Mixed stream:


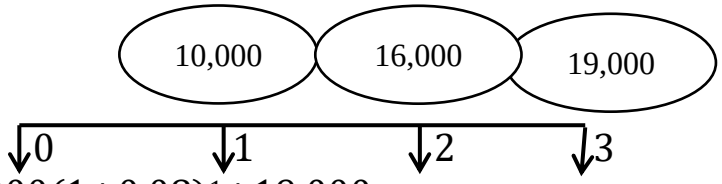
   $PV=FV/(1+r)^n$
   $=800+400/(1+0.09)^1+700/(1+0.09)^2$

4. Annuity due: (at the beginning of each year)
   $PV=CF/r\ (1-1/\ (1+r)^n)*(1+r)$
   $=300/0.09(1-1/\ (1+0.09)^{20})*(1+0.09)=\$2{,}985.03$

5. Single Amount: $FV=50{,}000(1+0.03)^{30}=\$121{,}363$

6. Perpetuity: $PV_{pep.}=CF/r=150{,}000/0.05=3{,}000{,}000$
- For the endowment for the ballet academy, the benefactor would provide 150,000 each year; however he would pay 3,000,000 from now.

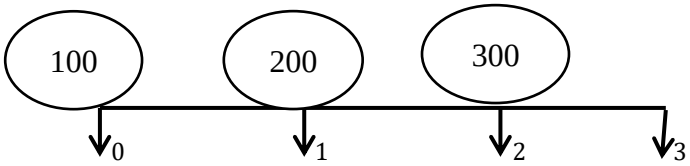
7. Scenario 1: $FV=10{,}000{,}000(1+0.1)^{20}=\$67{,}274{,}999$
   (Single amount)
   Scenario 2: $FV=1{,}000{,}000/0.1((1+0.1)^{20}-1)=\$57{,}274{,}999$
   (annuity)

8. Mixed stream:


   $Fv=PV(1+r)^n$
   $=10{,}000(1+0.08)^2+16{,}000(1+0.08)^1+19{,}000$
   $=\$47{,}944$

9. Ordinary Annuity: (calculate the CF)
$PV=CF/r\ (1-1/\ (1+r)^n)$ therefore; CF= $16,275
Given that; PV=100,000, n= 10, r= 10%

10. Mixed stream :



$Fv=PV(1+r)^n$
$=100(1+0.12)^3+200(1+0.12)^2+300(1+0.12)^3$
$= \$727.37$

11. Single Amount: $Fv=PV(1+r/m)^{n*m}$
$=6{,}000(1+ 0.08/4)^{2*4} = \$7{,}030$

12. Perpetuity: $\$2{,}000{,}000 \times 0.07 = \$140{,}000$
13. Annuity: $PVA = (960.43/0.08)[1-1/(1.08)^7] = \$5{,}000$
14. Answer: $PVA = (\$1{,}250/0.09) \times [1-1/(1.09)^5] = \$4{,}862.50$

- Mr. Handyman should choose a lump-sum of $5,000 today.

15.

a. Value at 13% required rate of return:

$$P_0 = \frac{\$3.02}{0.13 - 0.05} = \$37.75$$

b. Value at 10% required rate of return:

$$P_0 = \frac{\$3.02}{0.10 - 0.05} = \$60.40$$

$g= (\text{Dividend}_{\text{last year}}/ \text{Dividend}_{\text{first year}})^{1/n} -1 = 5\%$

16.

a. $P_o=D_o/r = 1.80/0.12 = \$15/\text{share}$
b. $D_1=D_o(1+g) = 1.80(1+0.05)= \$1.89/\text{share}$
$P_o= D_1/r-g = 1.89/0.12-0.05 = \$27/\text{share}$

Problem 17 :- $D_1 = D_0(1+g)$

a] Step1: $D_1 = 1.80(1+0.08) = 1.94$

$D_2 = 1.94(1+0.08) = 2.10$

$D_3 = 2.10(1+0.08) = 2.27$

Step2:

* $D_4 = D_3(1+g_2)$

$= 2.27(1+0.05) = 2.38$

Sum of PV $\Rightarrow$ * $PV = \frac{Fv}{(1+r)^n}$ * Use the Constant growth model to get P_3

$\Rightarrow P_3 = \frac{D_4}{r_s - g_2}$

$= \frac{2.38}{0.11-0.05} = \$39.67$

Step3:

$PV = \frac{1.94}{(1+0.11)^1} + \frac{2.10}{(1+0.11)^2} + \frac{2.27}{(1+0.11)^3} + \frac{39.67}{(1+0.11)^3} = \$34.12$

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b] here start from Step2: as you will calculate the new D_4 according to the new g_2

* $D_4 = 2.27(1+0) = 2.27$

* $P_3 = \frac{2.27}{0.11-0} = \$20.64$

Step3:

$PV = \frac{1.94}{(1+0.11)^1} + \frac{2.10}{(1+0.11)^2} + \frac{2.27}{(1+0.11)^3} + \frac{20.64}{(1+0.11)^3} = \$20.20$

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c] $D_4 = D_3(1+g_2)$

$= 2.27(1+0.1) = 2.50$

* $P_3 = \frac{2.50}{0.11-0.1} = \$250$

Step3:

$PV = \frac{1.94}{(1+0.11)^1} + \frac{2.10}{(1+0.11)^2} + \frac{2.27}{(1+0.11)^3} + \frac{250}{(1+0.11)^3}$

$= \$187.91$

18.

a. VC= $21,533,719

b. VS=Vc-Vd-Vp =21,533,719 – 12,500,000 – 0
= $9,053,719

c. price/share= VS/no. of shares = 9,053,719/500,000
= $18.11/share

19.

Firm	EPS × *P/E*	=	Stock Price
A	**3.0 × (6.2)**	**=**	**$18.60**
B	**4.5 × (10.0)**	**=**	**$45.00**
C	**1.8 × (12.6)**	**=**	**$22.68**

20)

Cash Budget

Month	August	September	October	November	December
Sales	$3,000,000	4,500,000	1,000,000	1,500,000	2,000,000
Cash (60%)	1,800,000	2,700,000	600,000	900,000	1,200,000
1 mo. (40%)		1,200,000	1,800,000	400,000	600,000
Interest					50,000
Total Receipts		3,900,000	2,400,000	1,300,000	1,850,000
Purchase	3,500,000	2,000,000	500,000	750,000	1,000,000
Cash(40%)	1,400,000	800,000	200,000	300,000	400,000
1 mo.(60%)		2,100,000	1,200,000	300,000	450,000
Salaries & Wages		450,000	675,000	150,000	225,000
Sales Commission		60,000	90,000	20,000	30,000
Lease Payments		100,000	100,000	100,000	100,000
Princ & Interest Pay					150,000
Cash dividends					50,000
Fixed assets purchase					600,000
Total Disbursements		3,510,000	2,265,000	870,000	2,005,000
Net cash flow		390,000	135,000	430,000	(155,000)
Add: Beg. Cash			100,000	235,000	665,000
Ending cash			235,000	665,000	510,000
Less: Min Cash			200,000	200,000	200,000
Required Fin.					
Excess Cash			35,000	465,000	310,000

The firm has excess cash during the three month period and can invest the excess cash in marketable securities.

21. <u>Loan Amortization Problems:</u>

A.

$PV = \frac{cf}{r}\left[1 - \frac{1}{(1+r)^n}\right]$

$6{,}000 = \frac{cf}{0.1}\left[1 - \frac{1}{(1+0.1)^4}\right]$

$6{,}000 = \frac{cf}{0.1}(0.316)$

$600 =$

$cf = 1{,}892.82$

Loan amortization Schedule

(o/s × 10% rate) (cf − Interest) (old o/s − Principle)

Years	cf	Interest	Principle	outstanding
0				6,000
1	1,892.82	600	1,292.82	4,707.18
2	1,892.82	470.718	1,422.102	3,285.08
3	1,892.82	328.51	1,564.31	1,720.77
4	1,892.82	172.077	1,720.743	0.027
				− 0 −
Total	7,571.28	1,571.305	6,000	

difference

B.

$PV = \frac{cf}{r}\left(1 - \frac{1}{(1+r)^n}\right)$

$100{,}000 = \frac{cf}{0.09}\left(1 - \frac{1}{(1+0.09)^4}\right)$

$cf = \frac{100{,}000 \times 0.09}{\left(1 - \frac{1}{(1+0.09)^4}\right)}$

Loan amortization Schedule

(o/s × rate) (cf − Interest) (old o/s − Principle)

Years	Cash flow	Interest 9%	Principle	outstanding
0				100,000
1	30,866.87	9,000	21,866.87	78,133.13
2	30,866.87	7,031.98	23,834.89	54,298.24
3	30,866.87	4,886.84	25,980.02	28,318.22
4	30,866.87	2,548.64	28,318.23	− 0 −
				0.01
Total	123,467.48	23,467.48	100,000	