5	a	An investment of Rs.5900 in new equipment is expected to have a salvage value of Rs.1000 after 4 years life. Using the sum of digits method find out the depreciation for every year and what is the depreciation amount to be collected after 2 years	10	CO3

Sol:

$$\text{Depreciation} = (\text{cost} - \text{Salvage}) \times \frac{\text{No. of years left}}{\text{Total years}}$$

Year 1

$$D_1 = \frac{(5900 - 1000) \times 4}{10}$$

Total years = 4+3+2+1
= 10

$$D_1 = 1960$$

Year 2

$$D_2 = \frac{(5900 - 1000) \times 3}{10}$$

$$D_2 = 1470$$

Year 3

$$D_3 = \frac{(5900 - 1000) \times 2}{10}$$

$$D_3 = 980$$

Year 4

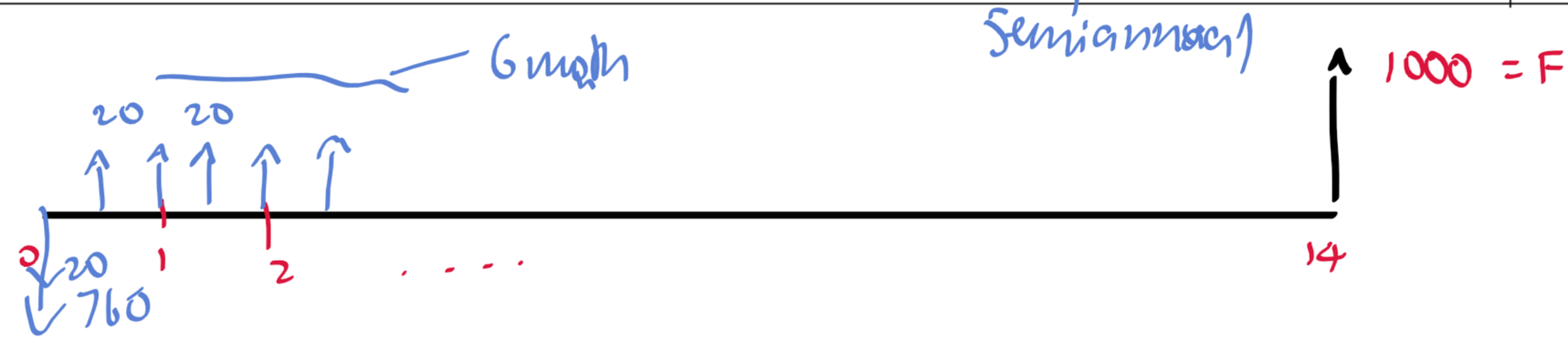
$$D_4 = \frac{(5900 - 1000) \times 1}{10}$$

$$D_4 = 490$$

Year	Depreciation	Accumulated depreciation
1	1960	1960
2	1470	3430 → After 2 years
3	980	4410
4	490	4900

7	b	A $ 1000 utility bond with 14 years remaining before maturity can now be purchased for $ 760. It pays interest of $20 each 6 month period. What is the rate of returned earned by purchasing the bond at the current market price plus a brokerage charge of $20.	6	CO3

SOL:



Assume i = 5% annual => 2.5% semi

$$PW = \frac{1000}{\left(1+\frac{0.05}{2}\right)^{14\times2}} + 20\left[\frac{(1.025)^{28}-1}{0.025(1.025)^{28}}\right] - 760 - 20$$

Present Brokerage

$$PW = \frac{1000}{1.99649} + 20\times 19.96488 - 780$$

$$PW = 120.1766 \rightarrow +ve$$

Assume i = 8% annual => 4% semi

$$PW = \frac{1000}{(1+0.04)^{14\times2}} + 20\left[\frac{(1.04)^{28}-1}{0.04(1.04)^{28}}\right] - 760 - 20$$

Present Brokerage

$$PW = \frac{1000}{2.9987} + 20\times 16.663 - 780$$

$$PW = -113.26216 \rightarrow -ve$$

Assume i = 6% annual => 3% semi

$$PW = \frac{1000}{(1+0.03)^{14\times2}} + 20\left[\frac{(1.03)^{28}-1}{0.03(1.03)^{28}}\right] - 760 - 20$$

Present Brokerage

$$PW = \frac{1000}{2.2879} + 20\times 18.7641 - 780$$

$$PW = 32.3640 \rightarrow +ve$$

i = 6% PW = 32.36
i = 8% PW = -113.26216

Interpolation

$$i = 6 + (8-6)\left[\frac{32.36-0}{32.36-(-113.26)}\right]$$

i = 6.44% annual