Date __/__/____

Assignment - 2

Q.1. i. APR

$20,000 = 12 \times 427.90 \; a_5^{(12)}$

$a_5^{(12)} = 3.89499$

Flat rate $= \dfrac{5 \times 12 \times 427.90 - 20000}{20,000 \times 5}$

$= 5.67\%$

APR (appox) $= 11\%$

At $i = 11\%$ $a_5^{(12)}$ @ $11\% = 3.87872$

At $a_5^{(12)}$ @ $10\% = 3.96154$

$$\frac{i - 10\%}{3.89499 - 3.96154} = \frac{11\% - 10\%}{3.8784 - 3.96154}$$

$i = 10.8\%$

APR $= 10.8\%$ //

Date __/__/____

Saathi

ii. After 1 year capital left

$= 12 \times 4727.90\ a_{4}^{(12)}$ @ 10.8%.

$= 16,775.8$

Let x denote the term of new loan

$16,775.98 = 12 \times 274.49\ a_{(4)}^{12}$

$16775.98 = 3293.88\ \frac{1-1.108^{(x)}}{12 \times (1.108)^{1/12} - 1}$

$1.108^{-x} = 0.4754$

$\boxed{x = 7.25}$

iii. Interest for original loan

$= 4 \times 12 \times 42.7 - 90 - 16775.98$

$= 3763.22$ //

$= 7.25 \times 12 \times 274.49 - 16775.98$

$= 7104.65$ //

Page No.

Saathi

Date ___/___/_____

4 Eg

4. $(I\ddot{a})_n = 1 + 2v + 3v^2 + 4v^3 + 5v^4 + \cdots nv^{n-1} + nv^n$

⊗ both sides by 'v'

$v(I\ddot{a})_n = v + 2v^2 + 3v^3 + 4v^4 + \cdots nv^n$

Subtracting,

$(1-v)(I\ddot{a})_n = 1 + v + v^2 + v^3 + v^4 + v^{n-1} + nv$

$(1-v)(I\ddot{a})_n = \frac{(1-v^n)}{(1-v) - nv^n}$

$d(I\ddot{a})_n = \ddot{a}_{\overline{n}|}$

$= nv^n$

$(I\ddot{a})_n = \frac{a_{\overline{n}|} - nv^n}{d}$

Hence Proved //

8. i) $2.7 + 0.2\, a_{\overline{3}|}$ @ 1 $\Rightarrow$ p.v

E(v) $0.1\, v^3 + \bar{a}_{\overline{10}|}(0.25v + 0.2v^2 + 0.11)$ @ i

Equating both sides

$2.7 + 0.2\, a_{\overline{3}|} = 0.103 + a_{\overline{10}|}(0.25 + 0.2v^2 + 10v$ @ i)

$i = 9.3\%$.

ii) $0.1v^3 + 0.85\, a_{\overline{10}|}\, v^3$

$0.1v^3 + 0.85\, \bar{a}_{\overline{10}|}\, v^3 - 2.7 - 0.29_3$ @ 10%.

$= 4.19 - 3.19$

$= 1.0089$

As NPV is positive it is worth investing. //

Saathi

Date ___ / ___ / ____

9. i) TWRR

$$(1+i) = \frac{33}{30-56} \times \frac{41.05-45 \times 45.6}{33+6 \quad 4\%} \times \frac{47}{(45.62-56)}$$

$$(1+i)^3 = 1.081967 \times 0.957179 \times 1.11084$$

$$= 1.22813$$

$$1+i = \sqrt[3]{1.22813}$$

$$i = 1.70951 - 1$$

$$i = 7.051\% \text{ //}$$

MWRR

$$= 30.5 \times (1+i)^3 + 6 \times (1+i)^{2-25} + 4.5 \times (1+i)^{15} - 2-5 \times (1+i)^{6.5}$$

$$= 47 \text{ //}$$

$i = 7\%$, 47 L.H.S = 46.74

$i = 7.5\%$ L.H.S = 47.3

MWRR = 7.20% //

iii) TWRR eliminates the effect of the cashflow amount & timing. and
∴ Gives a fair assisting investment performance.

Page No.