Q1.) APR = $\frac{\text{Avg annual int}}{\text{avg loan Amt}}$

$= \frac{2 \times \text{avg annual int}}{1/2 \times \text{original loan}}$

original amt = 20000

$20000 = 12 \times 427.90 \, a_{\overline{5}|}^{(12)}$

$= a_{\overline{5}|}^{(12)} = 3.8499$

flat rate = $\frac{5 \times 12 \times 423.90 - 20000}{20000 \times 5}$

$= 5.67\%$

APR $= 2 \times 5.67 = 11\%$

$i = 11\% \quad a_{\overline{5}|}^{(12)} = 3.87872$

$i = 10\%, \; a_{\overline{5}|}^{(12)} = 3.96154$

APR, I is $\frac{i - 10\%}{3.8499 - 3.96154} = \frac{11\% - 10\%}{3.87872 - 3.96154}$

$i = 10.8\%$

ii.) APR $= 10.8\%$

After 1 yrs $= 12 \times 427.90 \, a_{\overline{4}|}^{(12)} @ 10.8\%$

$= 16775.8$

$\therefore 16775.8 = 12 \times 274.49 \, a_{\overline{t}|}^{(12)}$

$16775.8 = 3293.88 \left[\frac{1 - 1.08^{-t}}{(2 \times (1.108^{1/2} - 1)}\right]$

$t = 7.25$ yrs.

Total Int = 4 x 12 x 7427.90 - 16[illegible]
= 3763.22

New loan's total int = 2.25% x 12 x 274.9 - 167.6
= ₹104.65

∴ They will have to pay 3341.28 more int.

02. (i) The discount payback period is used as a part of capital budgeting to determine which project to take on.

The period of time required for an investment to recover its initial outlay in terms of profits earning.

ii) The difference between both of them is that the payback period ~~covers~~ refers to the ~~length~~ period of time required to recover the lost whereas discounted payback period calculates the time period for an investment to recover the cost of an investment taking the time value of money.

Q. 03.] Annuity 1 = $200 \times v^{(1/4)} \times a_{\overline{22}|}$ at

$= 200 \times 0.980944 \times 10.200$

$= 2161.366301$

Annuity 2 = $320 (1+i)^{1/12} \times a^{(4)}_{\overline{6.25}|}$

$= 320 \times 1.006434 \times 9.184211$

$= 2957.670004$

Annuity 3 = $180 \times a^{(12)}_{\overline{18}|}$

$= 180 \times 9.892578702$

$= 1780.664166$

Total = 6899.96

Revised annuity = $x(1+i)^{1/4} + a^{(2)}_{\overline{21.5}|}$

$x = \frac{6899.96}{1.019427 \times 10.30886}$

$= 656.56$

Q4.] $(I\ddot{a})_n = 1 + 2v + 3v^2 + 4v^3 + 5v^4 \ldots$

Multiply v both sides

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

Sub

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

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

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

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

05) Property fund
TWRR = $\frac{16.4}{12-4} - 1$

$= 0.3226$

$= 32.226\%$

Equity fund

TWRR = $\frac{15.5}{12.1} - 1 = 28.1\%$

ii) Lets assume that he in vested
bought 100 units

$1240(1+i) + 1310(1+i)^{3/4} + 1480(1+i)^{1/2}$
$+ 1586(1+i)^{1/4}$

Q6) ~~Let x be ₹~~

i) $160000 \times a_{\overline{10}|8\%}$

$$x = \frac{160000}{a_{\overline{10}|}} = 23844.65$$

ii) $23844.65\, a_{\overline{6}|}$ @8% $= 23844.65 \times$

$= 110231.442$

Revised annual ~~investment~~ instalment =

$y\, a_{\overline{6}|} = 110231.442$ @

$$y = \frac{110231.442}{a_{\overline{6}|}}$$

$$= \frac{110231.442}{4.353}$$

$= ₹\ 25309.72$

iii) $25309.72\, a_{\overline{3}|}$ @ 10%.

25309.72×2.4869

$= 62942.94$

revised annual instalment

$z\, a_{\overline{3}|} = 62942.74$ @9%.

$z = ₹\ 24565.77$

Q7) i) The return in property is lower than the return in securities

ii)

~~Disadvantage~~

Disadvantage -

Q5. i. PV = $2.7 + a_{\overline{3}|} @ i$ — (1)

Expected PV = $1.03v^3 + \bar{a}_{\overline{10}|}(0.25v + 0.2v^2 + 0.1v^3)i$ — (2)

Equating (1) & (2)

$2.7 + a_{\overline{3}|} @ i = 1.03v^3 + \bar{a}_{\overline{10}|}(0.25v + 0.2v^2 + 0.1v^3)i$

Q5. ii. TWRR

$(1+i)^3 = \frac{33}{30.50} \times \frac{41.05 - 4.5}{33+6} \times \frac{45.6}{41.05} \times \frac{47}{45.6-20}$

$(1+i)^3 = 1.081967213 \times 0.937794872 \times 1.110840438 \times 1.090487$

$(1+i)^3 = 1.224841327$

$(1+i) = 1.070954281$

$i = 0.070954281$

TWRR = 7.09528%

MWRR

$30.5(1+i)^5 + 6(1+i)^{2.5} + 4.5(1+i)^{.5} - 2.5(1+i)^{?} - 47$

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a (iii) TWRR shows how well the investm
have performed over time. than
money stated weighted rate
return.

ii

c