Q no 1

i) Q: What is simple intrest?

Simple Intrest:-

Simple intrest is the simplest form of calculations of intrest payable or recievable on the money advance in exchange for its use.

Usage:- It has very limited usage now a days. It may be used in auto-loan or personal loan.

Formula:

simple intrest = Principle × rate × time

ii) Q: What is compound intrest? Why is it important?

Compound Intrest:-

Compound intrest is intrest calculated on the amount that includes the principle plus accumulated intrest of the previous period.

Formula:

$$\text{Compound intrest} = P \cdot [(1+i)^t - 2]$$

P = Principle
i = intrest rate
t = time period.

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Importance of Compound Interest:-

Compound interest has the most impact in long-term investing, since its effects increases as time goes on. It causes your wealth to grow faster. It makes a sum of money grow at a faster rate than simple interest because you will earn returns on the money you invest, as well as on returns at the end of every compounding period.

iii) Q: Define present value and future value.

Present value:

The today's value of a single payment or series of payment to be recived at a later date, given at a specified discount rate.

Formula:

$$PV = FV \times \frac{1}{(1+r)^n}$$

PV = Present value

FV = Future value

r = Rate of interest per annum

N = no. of years for which the amount have been invested.

Future value:-

The rising value of today's sum at a specified future date given at a specified rate of interest.

Formula:

$$FV = PV(1+r)^n$$

FV = Future value

PV = Present value

r = rate of interest per annum

n = no. of years for which the amount has been invested.

iv) Q: What is annuity? Define its type.

Annuity:-

An annuity is a series of equal payments made at the end of equal intervals of regular time periods for a fixed duration.

The time period could be weekly, monthly, quarterly, year or at any other time intervals.

Defining 4 types of annuities:-

i) Ordinary annuities

ii) Annuities Due

iii) Deferred annuities

iv) A perpetuity.

:) Ordinary annuities:-

The first payment is made at the end of the first period. Most home loans are structured this way.

:) Annuities due:-

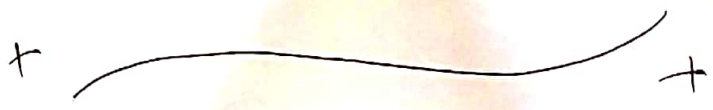
The first payment is made at the begining of the first period. Most leases are this way.

:) Deferred annuities:-

The first payment is deferred for a number of periods.

:) A perpetuity:-

An annuity in which payments continue indefinitely.



V): Q: What is capital budgeting? Explain different capital budgeting techniques.

Capital Budgeting:-

Capital budgeting is the process of evaluating and selecting long term investments that are consistent with the goals of shareholders (owners) wealth maximization.

or

The process that helps in planning the investment projects of an organization in long ~~term~~ run.

Techniques:

1) **Payback period:-** This method is used to know how much time it will take to recover the investment.

2) **Discount payback period:-**

- Same as payback period method. Only difference is that it considers discounted cash flows.

:) **Net present value:-**

It is the sum of all future discounted cash-flow less initial investment.

:) **Accouting Rate of Retun (ARR):-**

It is an accounting techinque to measure profit expected from an investment.

:) **Internal rate of Return (IRR):-**

It brings the cost of the project & its future cash flow at par with the initial investments

:) **Profitability Index:-**

It defines how much you will earn per dollar.

Formulas :-

) Payback period

[PBP = a + (b - c)/d]

Payback period = $\frac{\text{initial cash investment}}{\text{Annual cash flow}}$

or

PBP = no. of years - $\frac{\text{cumulative cash flow}}{\text{cash flow}}$

) Discount payback period :-

Discount Payback period = Years Until Break-Even + $\frac{\text{Unrecovered amount}}{\text{Cash flow in recovery}}$

) Net present value (NPV) :-

$$NPV = \left[\frac{A_1}{(1+k)^1} + \frac{A_2}{(1+k)^2} + \frac{A_3}{(1+k)^3} + \dots + \frac{A_n}{(1+k)^n} \right] - C$$

where A_1, A_2, A_3 -- represents cash inflows
K is the firm's cost of capital.
C is the cost of the investment proposal.
n is the expected life of the proposal.

• Accounting rate of return:-

$$ARR(\%) = \frac{\text{Total net profit} / \text{no. of years}}{\text{initial cost}} \times 100$$

or

$$ARR = \frac{\text{Average net profit}}{\text{Average investment}}$$

• Internal rate of return:-

$$IRR = LR + \frac{LNPV \times (HR - LR)}{(LNPV - HNPV)}$$

LR = lower discount rate.

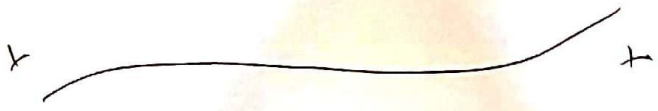
HR = Higher discount rate

HNPV = Higher Net present value

LNPV = low Net present value.

• Profitability index:-

$$PI = \frac{\text{Present value of future cash flow}}{\text{initial investment}}$$



Q no 2

(a)

when rate is 6%

$$PV = C \times \left[\frac{1-(1+i)^{-n}}{i}\right]$$

$$PV = 7000\left[\frac{1-(1+6\%)^{-20}}{6\%}\right]$$

$$PV = 80,290 \quad \text{Ans}$$

(b)

When rate is 8%

$$PV = C \times \left[\frac{1-(1+i)^{-n}}{i}\right]$$

$$PV = 7000\left[\frac{1-(1+8\%)^{-20}}{8\%}\right]$$

$$PV = 68,726 \quad \text{Ans}$$

(10)

Q no 3

$$PV = C \times \left[\frac{1-(1+i)^{-n}}{i}\right]$$

$i = 6\%$

$n = 12$

$PV = 25,000$

$$25,000 = C\left[\frac{1-(1+6\%)^{-12}}{6\%}\right]$$

$$25,000 = C(8.383)$$

$$C = \frac{25,000}{16.869}$$

$$C = \frac{25,000}{8.3838}$$

$$C = 2982.92$$

$$\approx$$

$$C = 2982$$ ✓

Q no 4

$i = 8\%$

$n = 10$

$FV = 50,000$

Formula:

$$FV = C\left[\frac{(1+i)^n - 1}{i}\right]$$

$$50,000 = C\left[\frac{(1+8\%)^{10} - 1}{8\%}\right]$$

$$50,000 = C(14.486)$$

$$C = \frac{50,000}{14.486}$$

$$C = 3451.87$$

$$C = 3452$$ ✓

Q no 5

(a)

IRR for each project A:

$$\frac{1000}{(1+x)^1} + \frac{1000}{(1+x)^2} + \frac{1000}{(1+x)^3} + \frac{1000}{(1+x)^4} - 2000 = 0$$

$x = 34.90$ percent

IRR for project B:-

$$\frac{0}{(1+x)^1} + \frac{0}{(1+x)^2} + \frac{0}{(1+x)^3} + \frac{6000}{(1+x)^4} - 2000 = 0$$

$x = 32.62$ percent

→

Net present value for each project at discount rate of 5 percent

for project A

$$NPV = \left(\frac{1000}{(1+5\%)^1} + \frac{1000}{(1+5\%)^2} + \frac{1000}{(1+5\%)^3} + \frac{1000}{(1+5\%)^4}\right) - 2000$$

$$NPV = 1545.95$$

for Project B

$$NPV = \left(\frac{0}{(1+5\%)^1} + \frac{0}{(1+5\%)^2} + \frac{0}{(1+5\%)^3} + \frac{6000}{(1+5\%)^4}\right) - 2000$$

$$NPV = 2936.22$$

(c)

Project A's IRR is greater than Project B. Based on IRR, project A should be accepted.

If the discount rate is 5%, then project A should be accepted. The superior project will be the one having highest NPV at the required rate of return. So greater NPV is of Project B

Q no 6

Qno 6

Project A		Project B	
	rate 12%		
0	-5000	0	-4000
1	-1500	1	-900
2	-1500	2	-900
3	-1500	3	-900
4	-1500	4	-900
5	-1500	5	-900
6	-1500	6	-900

(a)

PBP of Project x:

$PBP_x = 3 + (5000 - 4500)/1500$

$PBP_x = 3.33$ years

PBP of Project y:-

$PBP_y = 4 + (4000 - 3600)/900$

$PBP_y = 4.44$ years

(b)

VPV of project x:-

$$NPV = \left[\frac{1500}{(1+0.12)^1} + \frac{1500}{(1+0.12)^2} + \frac{1500}{(1+0.12)^3} + \frac{1500}{(1+0.12)^4} + \frac{1500}{(1+0.12)^5} + \frac{1500}{(1+0.12)^6} \right] = 500$$

$$NPV = 6167.101 - 5000$$

$$\boxed{NPV = 1167.101}$$ (positive (>1)), so accept the project.

NPV of project y:

$$NPV = \left[\frac{900}{(1+0.12)^1} + \frac{900}{(1+0.12)^2} + \frac{900}{(1+0.12)^3} + \frac{900}{(1+0.12)^4} + \frac{900}{(1+0.12)^5} + \frac{900}{(1+0.12)^6} + \frac{900}{(1+0.12)^6} \right] - 4000$$

$$NPV = 3700.284 - 4000$$

$$\boxed{NPV = -299.73}$$ (< 0 (negative)), so reject the project

(C)

IRR of Project x:

let interest rate 15%

At 15%: $PV = \left[\frac{1500}{(1+15)^1} + \frac{1500}{(1+15)^2} + \frac{1500}{(1+15)^3} + \frac{1500}{(1+15)^4} + \frac{1500}{(1+15)^5} + \frac{1500}{(1+15)^6} \right]$

$$PV = 5676.72$$

At 20%:

$$PV = 4988.26$$

$$0.05 \left[\begin{matrix} x & 15\% & 5676.72 \\ IRR & & 5000 \\ 20\% & & 4988.26517 \end{matrix} \right] \begin{matrix} 676.72 \\ \\ \end{matrix} \Bigg) 688.45485$$

→

∴ IRR = 15% + x

$\frac{x}{0.05} = \frac{676.72}{688.45485}$

x = 0.04914

IRR = 15% + 4.9147%

IRR = 19.9147%

IRR of project y:-

let interest rate 5% :-

At 5% $PV = 900\left[\frac{1-\left(\frac{1}{(1.05)}\right)^{6}}{0.05}\right]$

PV = 4568.12286

At 10% $PV = 900\left[\frac{1-\left(\frac{1}{(1.10)^{6}}\right)}{0.10}\right]$

PV = 3919.73463

0.05	5%	4568.12286	568.12286
x		4000	648.38827
	10%	3919.73463	

IRR = 5% + x

$\frac{x}{0.05} = \frac{568.12286}{648.38827} \Rightarrow x = 0.043810$

IRR = 5% + 0.043810

IRR = 5 + 4.3810

IRR = 9.3810%

(d)

As we find PBP of Project 1 is less than project 2 so, we will accept project 1. from part we find the NPV of Project 1 is greater than 0 and positive on the other hand, NPV of project y is less than 0 and negative, so we will reject project 2 i.e y, and will accept project 1 from part c we find that the rate of return of project x is greater so we conclude from all parts that we give priority to project 1 on project 2.