① Fixed Instalment Method

① percentage is given

Asset = 100000 $= 100000 \times \frac{10}{100}$

$= 10000$

↓

Depreciation

② If percentage is not given

$$Dep = \frac{\text{Cost of the Asset} - \text{Scrap value}}{\text{Estimated life of the asset}}$$

③ Rate of Dep $= \frac{Dep}{Cost} \times 100$

The sales and profit figures of 2 years are given below:

Year	sales	profit
31/3/2016	150000	20000
31/3/2017	170000	25000

you are required to calculate

a) PV ratio

b) Break even point

c) The sales required to earn profit of ₹ 40000

d) Margin of safety at a profit of ₹50000

e) The profit made when sales are ₹ 250000

Solution

Profit when sales ₹ 250000

Profit = Sales x PV ratio- fixed cost

= 250000 x 25/ 100- 17500

= 62500 - 17500

= ₹ 45000

Net Present Value Method (NPV)

NPV is the difference between the Present value of Cash Inflows & the Present value of Cash outflows: → Investment

$NPV = CI - CO$

$$NPV = \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_n}{(1+k)^n}$$

Advantages:

1. Consider all cash flows over the full period of a project
2. It considers Time Value of Money
3. Measures true profitability

Acceptance Rule:

→ Accept the project when NPV > 0 (Positive)

X → Reject " " " NPV < 0 (Negative)

To calculate present value = $\frac{1}{(1+r)^1}$ (10%)

I: 100cw → (2 years) → 80cw

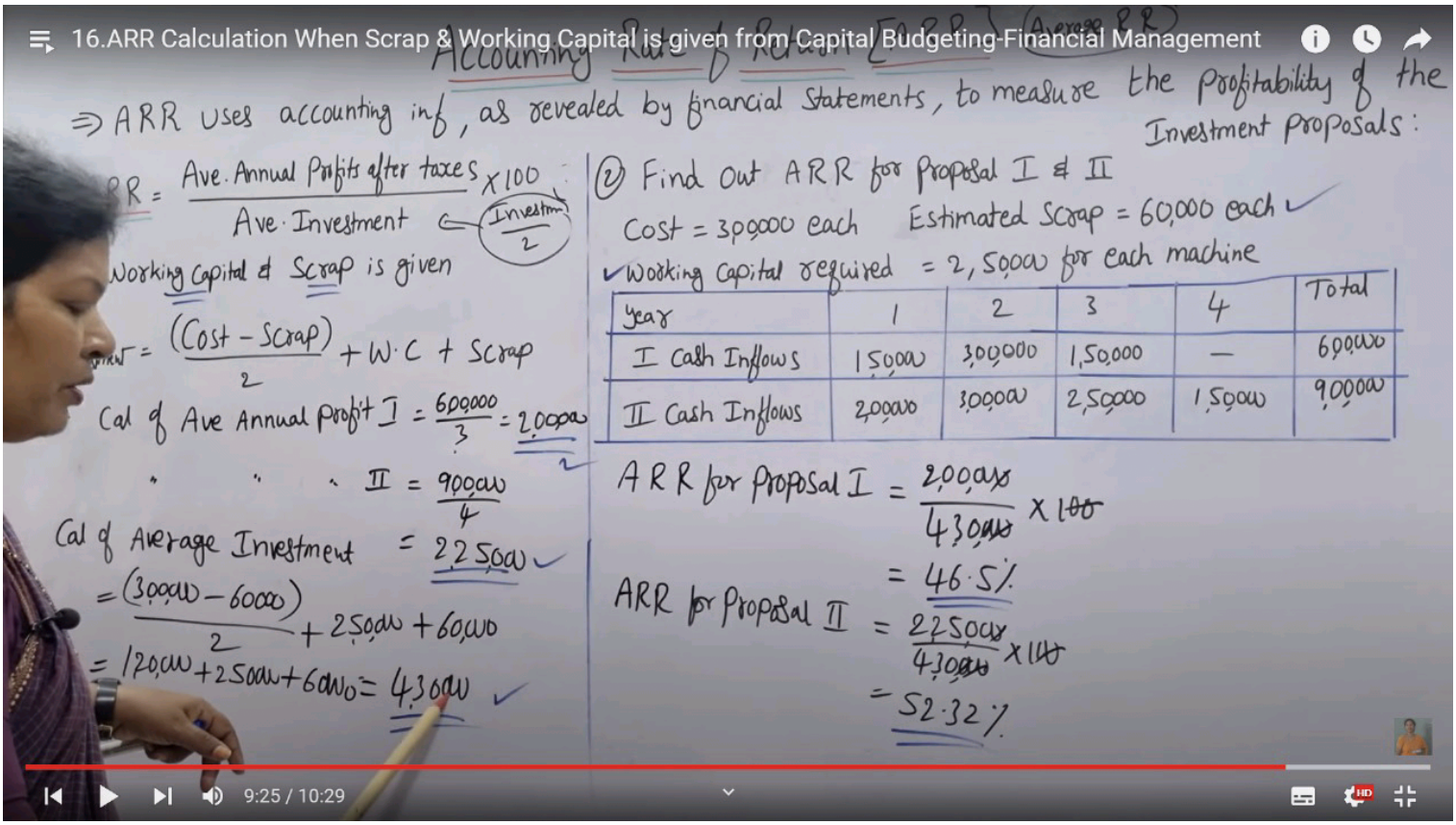
II: 100cw → (2yr) → 120cw

20cw → Present Value

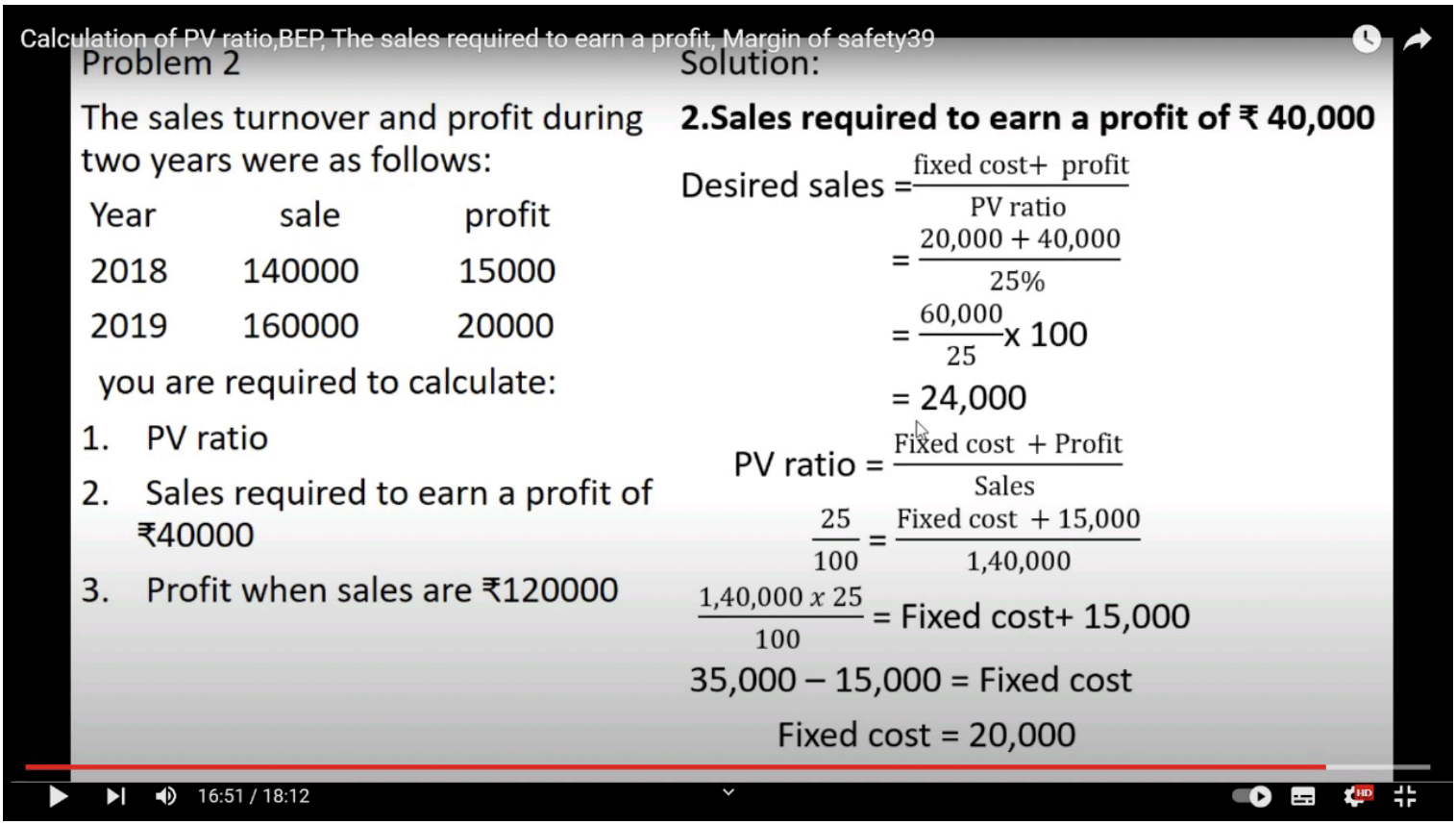
$= \frac{1}{(1+\frac{10}{100})}$ I yr .0.909

$= \frac{1}{1+0.10}$ II 0.826

$= \frac{1}{1.10}$ III 0.751



Year	1	2	3	4	Total
I Cash Inflows	1,50,000	3,00,000	1,50,000	—	6,00,000
II Cash Inflows	2,00,000	3,00,000	2,50,000	1,50,000	9,00,000


Calculation of PV ratio,BEP, The sales required to earn a profit, Margin of safety39
Problem 2
The sales turnover and profit during two years were as follows:
Year sale profit
2018 140000 15000
2019 160000 20000
you are required to calculate:
1. PV ratio
2. Sales required to earn a profit of ₹40000
3. Profit when sales are ₹120000
Solution:
2.Sales required to earn a profit of ₹ 40,000
Desired sales = fixed cost+ profit / PV ratio
= 20,000 + 40,000 / 25%
= 60,000 / 25 x 100
= 24,000
PV ratio = Fixed cost + Profit / Sales
25/100 = Fixed cost + 15,000 / 1,40,000
1,40,000 x 25 / 100 = Fixed cost+ 15,000
35,000 – 15,000 = Fixed cost
Fixed cost = 20,000
16:51 / 18:12

The sales and profit figures of 2 years are given below:

Year	sales	profit
31/3/2016	150000	20000
31/3/2017	170000	25000

you are required to calculate

a) PV ratio

b) Break even point

c) The sales required to earn profit of ₹ 40000

d) Margin of safety at a profit of ₹50000

e) The profit made when sales are ₹ 250000

Solution

Break even point = $\frac{\text{fixed cost}}{\text{PV ratio}}$

$= \frac{17500}{25\%}$

$= \frac{17500 \text{ X } 100}{25}$

= ₹ 70000

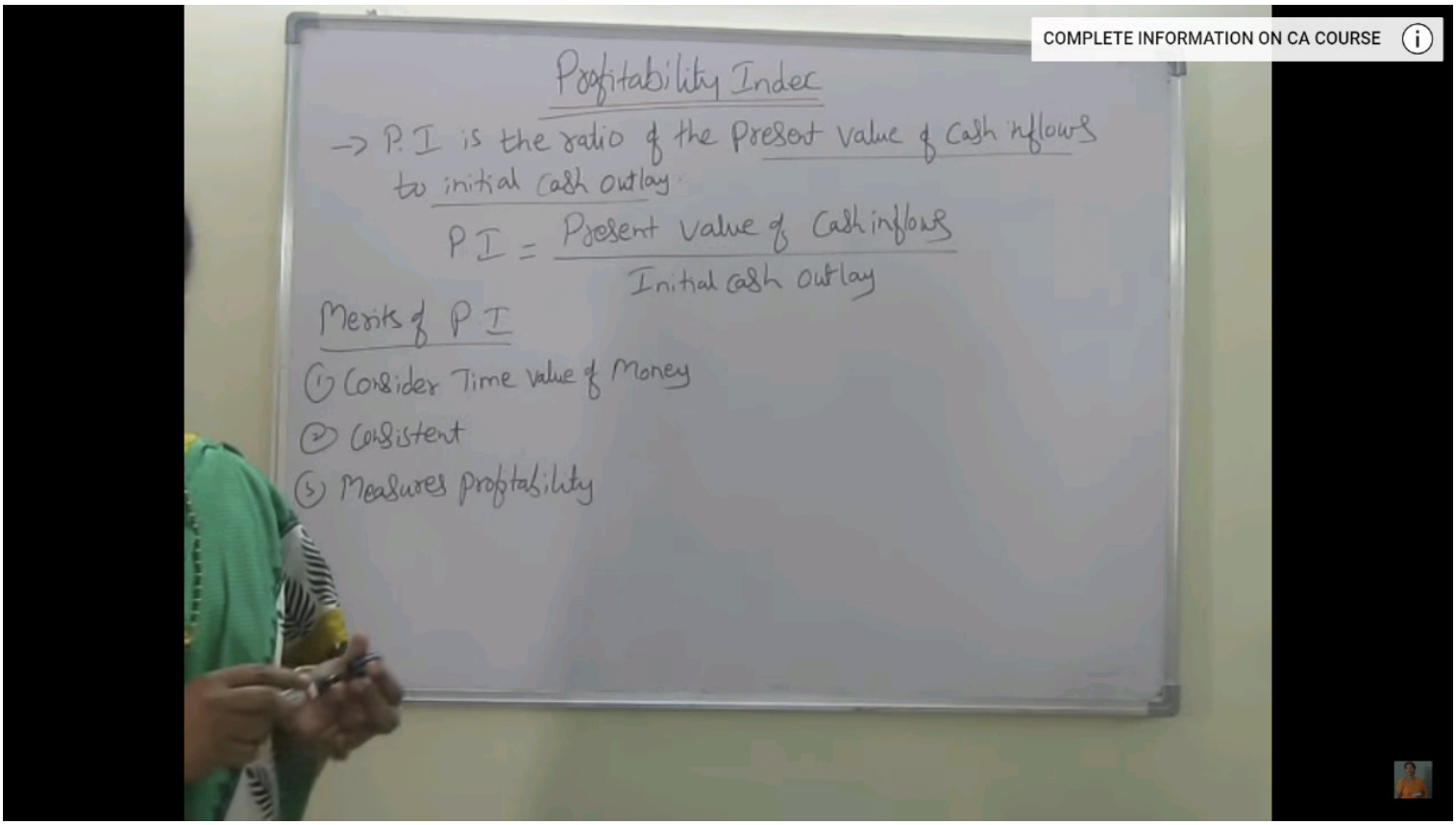
Note:

Fixed cost = sales X PV ratio - profit

= 150000 X $\frac{25}{100}$ - 20000

= 37500 - 20000

= ₹ 17500


COMPLETE INFORMATION ON CA COURSE
Profitability Index
-> P.I is the ratio of the Present Value of Cash inflows to initial cash outlay.
PI = Present Value of Cash inflows / Initial cash outlay
Merits of PI
1) Consider Time value of Money
2) Consistent
3) Measures profitability

The sales and profit figures of 2 years are given below:

Year	sales	profit
31/3/2016	150000	20000
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you are required to calculate

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c) The sales required to earn profit of ₹ 40000

d) Margin of safety at a profit of ₹50000

e) The profit made when sales are ₹ 250000

Solution

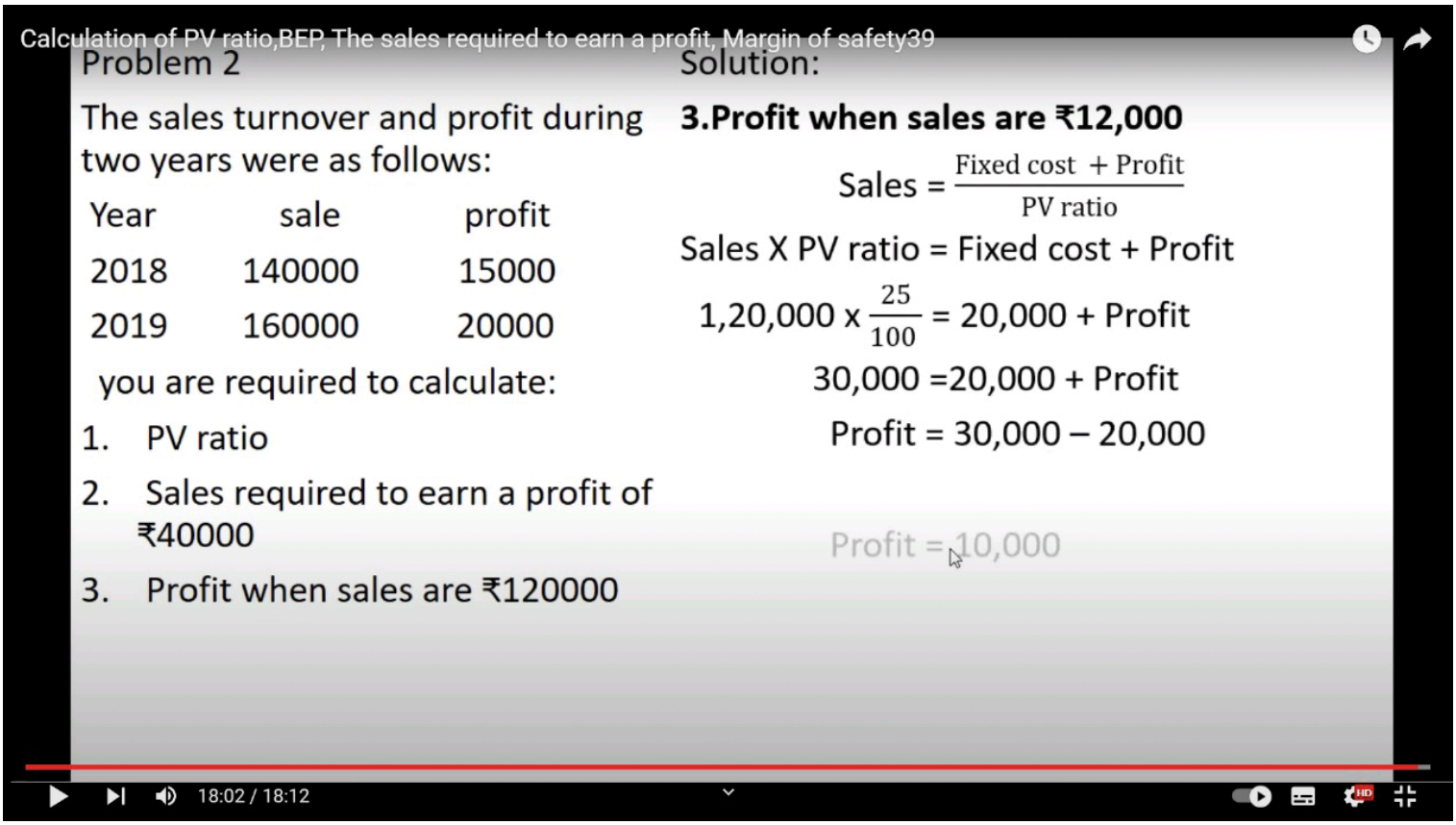
The sales when profit earn of ₹ 40000

$$\text{sales} = \frac{\text{fixed cost} + \text{desired profit}}{\text{PV ratio}}$$

$$= \frac{17500 + 40000}{25\%}$$

$$= \frac{57500 \text{X } 100}{25}$$

$$= ₹\ 230000$$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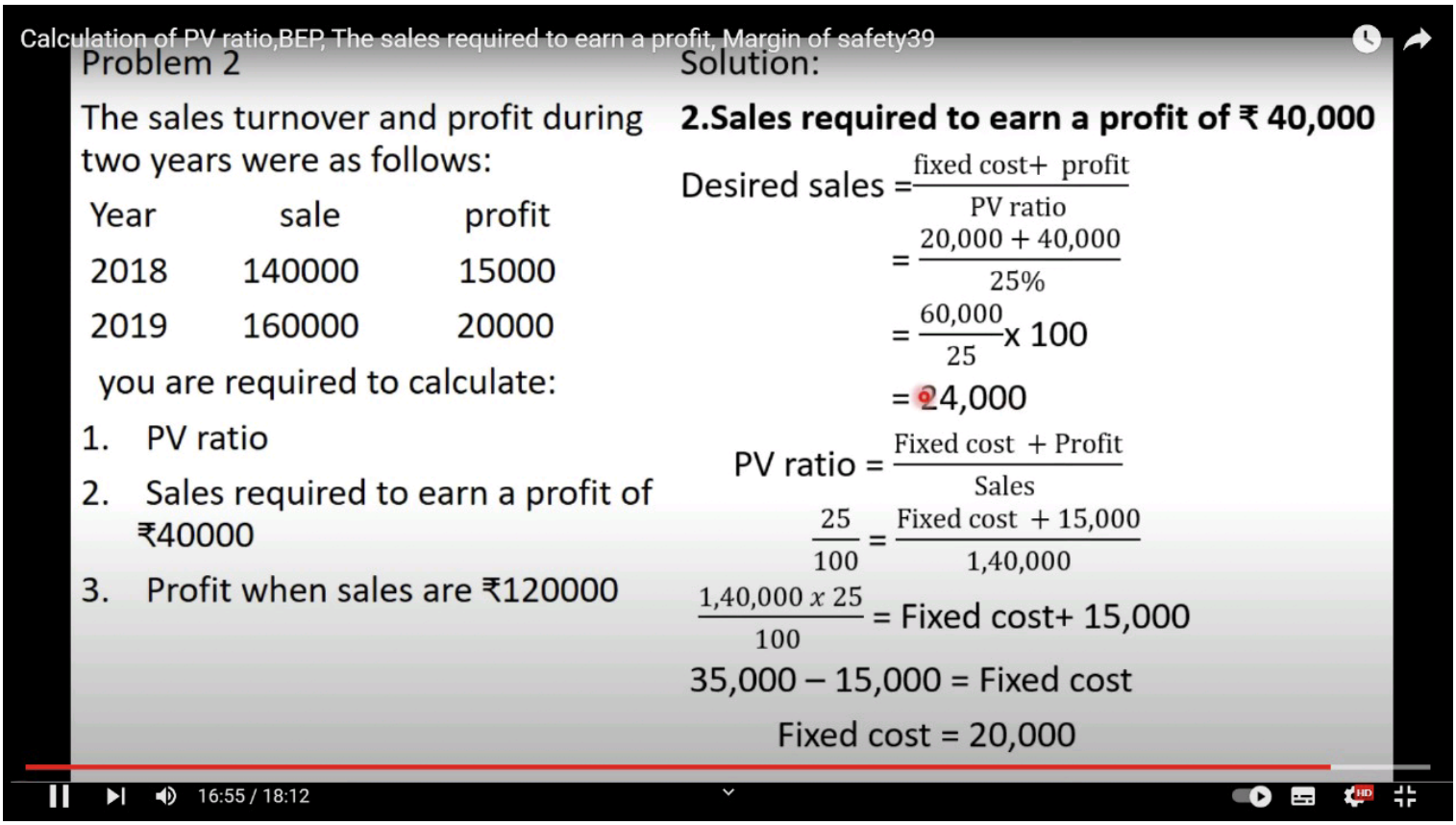
1. PV ratio
2. Sales required to earn a profit of ₹40000
3. Profit when sales are ₹120000
Solution:
3.Profit when sales are ₹12,000
Sales = Fixed cost + Profit / PV ratio
Sales X PV ratio = Fixed cost + Profit
1,20,000 x 25/100 = 20,000 + Profit
30,000 =20,000 + Profit
Profit = 30,000 – 20,000
Profit = 10,000
18:02 / 18:12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2.Sales required to earn a profit of ₹ 40,000
Desired sales = fixed cost+ profit / PV ratio
= 20,000 + 40,000 / 25%
= 60,000 / 25 x 100
= 2,40,000
PV ratio = Fixed cost + Profit / Sales
25/100 = Fixed cost + 15,000 / 1,40,000
1,40,000 x 25 / 100 = Fixed cost+ 15,000
35,000 – 15,000 = Fixed cost
Fixed cost = 20,000
16:55 / 18:12

Internal Rate of Return [IRR]

IRR equates the Present Value Cash inflows with the Present value of Cash outflows.

IRR Calculation steps:

① Calculate Two NPVs at different cost of capital

② $IRR = L + \frac{PV_L - \text{Cash outflow}}{PV_L - PV_H} \times H - L$

L = Lower rate H = Higher rate

PV_L = PV at Lower rate, PV_H = PV at Higher rate

Calculation of NPV

- Positive (+) → Calculate NPV at Higher rate
- Negative (−) → Lower rate

10% → (−) → 9% ✓, 8% ✓, 7% ✓

Acceptance Rule

→ Accept the project when $r > K$

→ Reject " " $r < K$

① A Project requires an investment of ₹ 12,00,000 & has a 4 years life Cash inflows are 4,50,000 – 5,40,000 – 3,60,000 – 2,82,000. The cost of capital is 11%. Calculate IRR. ✓

Calculation of NPV ✓

year	Cashflow	PV@11%	PVCF	PV@15%	PVCF
1	4,50,000	0·9009	405,405	0·8696	391,320
2	5,40,000	0·8116	4,38,264	0·7561	4,08,294
3	3,60,000	0·7312	2,63,232	0·6575	2,36,700
4	2,82,000	0·6587	1,85,754	0·5718	161248
		✓	12,92,654	✓	11,97,562

$\frac{1}{1+r}$

$\frac{1}{1+\frac{1}{15}} = \frac{1}{1+0.15} = \frac{1}{1.15}$

NPV @ 11% cost of capital = 12,92,654 − 12,00,000

(+) = 92654 ✓

NPV @ 15 = 1197562 − 12,00,000 = −2438

$IRR = 11 + \frac{12,92,654 - 12,00,000}{12,92,654 - 1197562} \times 4$

$= 11 + \frac{92654}{95092} \times 4$

$= 11 + \frac{370,616}{95092}$

$= 11 + 3.90$

$= 14.90$ ✓

(1) Calculate NPV for the given Projects & Comment on the results? Project Cost = 200

The Company anticipates the Cost of Capital of 12%.

Year	1	2	3	4	5
A Cash Inflows	35	80	90	75	20
B Cash Inflows	18	10	10	40	35

Sol

Calculation of NPV for Project A

Year	CFAT	P.V factor @ 12%	PV of CFAT
1	35	0.893	31.255
2	80	0.797	63.76
3	90	0.712	64.08
4	75	0.636	47.7
5	20	0.567	11.34
			218.135

Calculation of NPV for Project B

Year	CFAT	P.V factor @ 12%	PV of CFAT
1	18	0.893	16.074
2	10	0.797	7.97
3	10	0.712	7.12
4	40	0.636	25.44
5	35	0.567	19.845
			76.449

NPV = Cash Inflow of Present Value − Cash outflow

= 218.135 − 200 = 18.135 ✓

NPV = 76.449 − 200

= −123.55 ✓

Project A is recommended as its NPV is higher than Project B.

I. Payback Period Method

Where the Cash Inflows Are Even :

$$\text{Payback Period} = \frac{\text{Cost of the Project}}{\text{Annual Cash Inflows}}$$

(1) The cost of a project is ₹ 1,00,000, the cash inflows for the next 6 years are 25,000. What is the payback period for the project ?

Sol

$$\text{Payback Period} = \frac{1,00,000}{25,000}$$

$$= 4 \text{ years}$$

Where the Cash Inflow Are Uneven :

(2) The cost of a project is ₹ 50,000 which has an expected life of 5 years. The cash inflows for the next 5 years are ₹ 24,000 - ₹ 26,000 - ₹ 20,000 - ₹ 17,000 & ₹ 16,000 respectively. Determine the payback period.

Sol

Year	Cash inflows	Cumulative Cash flows
1	24,000	24000
2	26,000	50000
3	20,000	70000
4	17000	87000
5	16000	103000

As per the above table payback period is 2 years

Accounting Rate of Return [ARR] (Average RR)

⇒ ARR uses accounting inf, as revealed by financial statements, to measure the profitability of the Investment proposals:

① $ARR = \frac{\text{Ave. Annual Profits after taxes}}{\text{Ave. Investment}}$ ← (Investment / 2)

If Working Capital & Scrap is given

$$\text{Ave Investment} = \frac{(\text{Cost} - \text{Scrap})}{2} + \text{W.C} + \text{Scrap}$$

Advantages:

→ It is easy to understand & calculate
→ It can be compared
→ It considers all the cash inflows

Disadvantages:

→ Time value of money is ignored.
→ High & wild fluctuations time Average concept is not reliable

① A firm is considering two projects each with an initial investment of ₹ 20,000 & a life of 4 years. Cash inflows after taxes are given. Calculate ARR

Year	1	2	3	4	Total
Proposal I (Cash Inflow)	12,000	13,000	14,000	16,000	55000
Proposal II (Cash Inflow)	12,500	14,500	15,500	18,000	60 500

Ave. Annual profits I = $\frac{55000}{4} = 13,750$

II = $\frac{60\,500}{4} = 15,125$

Ave Investment = $\frac{20,000}{2} = 10,000$

ARR for Proposal I = $\frac{13750}{10000} \times 100 = 137.5\%$ ✓

" " Proposal II = $\frac{15125}{10,000} \times 100 = 151.25\%$ ✓

The sales and profit figures of 2 years are given below:

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31/3/2016	150000	20000
31/3/2017	170000	25000

you are required to calculate

a) PV ratio

b) Break even point

c) The sales required to earn profit of ₹ 40000

d) Margin of safety at a profit of ₹50000

e) The profit made when sales are ₹ 250000

Solution

Margin of safety At a profit of of ₹ 50000

$$\text{Margin Of safety} = \frac{\text{profit}}{\text{PV ratio}}$$

$$= \frac{50000}{25\%}$$

$$= \frac{50000 \text{x } 100}{25}$$

= ₹ 200000