



Question: 10

Trouble Free Solutions (TFS) is an authorized service center of a reputed domestic air conditioner manufacturing company. All complaints/service related matters of Air conditioner are attended by this service center. The service center employs a large number of mechanics, each of whom is provided with a motor bike to attend the complaints. Each mechanic travels approximately 40,000 kms per annum. TFS decides to continue its present policy of always buying a new bike for its mechanics but wonders whether the present policy of replacing the bike every three year is optimal or not. It is of believe that as new models are entering into market on yearly basis, it wishes to consider whether a replacement of either one year or two years would be better option than present three year period. The fleet of bike is due for replacement shortly in near future.

The purchase price of latest model bike is ₹ 55,000. Resale value of used bike at current prices in market is as follows:

Period	₹
1 Year old	35,000
2 Year old	21,000
3 Year old	9,000

Running and Maintenance expenses (excluding depreciation) are as follows:

Year	Road Insurance etc. (₹)	Taxes (₹)	Petrol Maintenance (₹)	Repair etc.
1		3,000		30,000
2		3,000		35,000
3		3,000		43,000

Using opportunity cost of capital as 10% you are required to determine optimal replacement period of bike.

TYK 25

Question: 08

Company Y is operating an elderly machine that is expected to produce a net cash inflow of ₹ 40,000 in the coming year and ₹ 40,000 next year. Current salvage value is ₹ 80,000 and next year's value is ₹ 70,000. The machine can be replaced now with a new machine, which costs ₹ 1,50,000, but is much more efficient and will provide a cash inflow of ₹ 80,000 a year for 3 years. Company Y wants to know whether it should replace the equipment now or wait a year with the clear understanding that the new machine is the best of the available alternatives and that it in turn be replaced at the optimal point. Ignore tax. Take opportunity cost of capital as 10 per cent. Advise with reasons.

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Statement showing Calculation of NPV

ICAI

	YEAR	PVF (10%)	Replace Now		Replace one YEAR	
			Amt	P.V.	Amt	P.V.
<u>Cash Outflows</u>						
Cost of New Machine	0	1.000	150000	150000	—	—
	1	0.909	—	—	150000	136350
Sale of old Machine	0	1.000	(80000)	(80000)	—	—
	1	0.909	—	—	(70000)	(63636)
				<u>70000</u>		<u>72720</u>
<u>Cash Inflows</u>						
CFAT	1-3	2.487	80000	198960	—	—
	1	0.909	—	—	40000	36360
	2-4	2.261	—	—	80000	180880
				<u>198960</u>		<u>217240</u>
				<u>128960</u>		<u>144520</u>

(A)

(B)

NPV(B-A)

(A)
(B)
NPV(B-A)

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Machine should be replaced in YEAR 1 due to Higher NPV

Question: 06

SM TYK 22

Imp

A & Co. is contemplating whether to replace an existing machine or to spend money on overhauling it. A & Co. currently pays no taxes. The replacement machine costs ₹ 90,000 now and requires maintenance of ₹ 10,000 at the end of every year for eight years. At the end of eight years it would have a salvage value of ₹ 20,000 and would be sold. The existing machine requires increasing amounts of maintenance each year and its salvage value falls each year as follows:

Year	Maintenance (₹)	Salvage (₹)
Present	0	40,000 ✓
1	10,000 ✓	25,000
2	20,000 ✓	15,000 ✓
3	30,000	10,000
4	40,000	0

The opportunity cost of capital for A & Co. is 15%.

Required:

When should the company replace the machine?

(Notes: Present value of an annuity of Re. 1 per period for 8 years at interest rate of 15% : 4.4873; present value of Re. 1 to be received after 8 years at interest rate of 15% : 0.3269).

New Machine

Cost of New Machine = ₹ 90,000

(+) P.V. of Maintenance cost =
(₹ 10,000 × 4.4873) = ₹ 44,873

(-) P.V. of Salvage
(₹ 20,000 × 0.3269) = (6,538)

Cost

₹ 128,335

Equivalent cost = $\frac{128,335}{4.4873}$

= 28,600

	YEAR	PVF (15%)	NOW		1 YEAR		2 YEAR		3 YEAR		4 YEAR	
			Amt	P.V.	Amt	P.V.	Amt	P.V.	Amt	P.V.	Amt	P.V.
EAC Net of Salvage	0	1.000	11400	11400	-	-	-	-	-	-	-	-
	1	0.870	-	-	(3000)	(3132)	-	-	-	-	-	-
	2	0.756	-	-	-	-	(18600)	(10282)	-	-	-	-
	3	0.658	-	-	-	-	-	-	(18600)	(12239)	-	-
	4	0.572	-	-	-	-	-	-	-	-	(28600)	(16359)
Maintenance cost	1	0.870	-	-	(10000)	(8700)	(10000)	(8700)	(10000)	(8700)	(10000)	(8700)
	2	0.756	-	-	-	-	(20000)	(15120)	(20000)	(15120)	(20000)	(15120)
	3	0.658	-	-	-	-	-	-	(20000)	(13160)	(30000)	(19740)
	4	0.572	-	-	-	-	-	-	-	-	(40000)	(22880)
				11400		(11832)		(39102)		(55799)		(89799)