❑ Net Present Value Method ❑

16. A company is considering investment in a project that costs ₹ 9 lakh with a working life of 5 years. It is expected that annual cash inflows of ₹ 1,50,000, ₹ 2,00,000, ₹ 2,50,000, ₹ 3,00,000 and ₹ 3,50,000 will be obtained from the project at the end of 1st, 2nd, 3rd, 4th and 5th year respectively. If the required rate of return is 10%, calculate the Net Present Value of the project.

Ans. NPV = ₹ 11,550

17. A project requires an initial outlay of ₹ 6,00,000. The working life of the project is 5 years. The estimated cash inflows that will be generated from the project are :

Year	:	1	2	3	4	5
Cash inflows (₹)	:	80,000	1,20,000	2,00,000	2,40,000	1,60,000

If the cost of capital is 10%, calculate the NPV of the project.

Ans. NPV = (–) ₹ 14,680

18. Shital Chemical Ltd. desires to undertake an investment project, for which it has the following five projects :

Project	*Initial investment* ₹	*Annual cash inflows* ₹	*Life* *Years*
A	9,00,000	2,25,000	6
B	15,00,000	3,00,000	8
C	20,00,000	3,25,000	12
D	30,00,000	4,50,000	15
E	40,00,000	5,25,000	20

If the cost of capital is 12%, which project should be accepted by the company ?

Given : Present value of the annuity of ₹ 1 at a discount @ 12% :

for 6 years = ₹ 4.111
for 8 years = ₹ 4.968
for 12 years = ₹ 6.194
for 15 years = ₹ 6.811
for 20 years = ₹ 7.469

Answer		
Project A : ₹ 24,975,	Project B : (–) ₹ 9,600,	Project C : ₹ 13,050
Project D : ₹ 64,950,	Project E : (–) ₹ 78,775	

19. A company has a project having an additional life of 5 years. It generates annual cash inflow of ₹ 30,000. At present, the company wants to undertake a new project which requires an initial investment of ₹ 3,90,000. The new project will also have a working life of 5 years. If the new project is undertaken by the company, its future cash inflows will be increased to :

1st year : ₹ 1,05,000
2nd year : ₹ 1,20,000
3rd year : ₹ 1,35,000
4th year : ₹ 1,50,000

5th year : ₹ 1,65,000

If cost of capital is 10%, should the new project be undertaken ?

Ans. No, NPV = (–) ₹ 2,835

20. A machine costing ₹ 1,20,000 is required in order to undertake a proposed project. The effective life of the machine is 5 years. The estimated earnings before depreciation and tax of the project are as follows :

Year	₹
1st	48,000
2nd	56,000
3rd	64,000
4th	40,000
5th	32,000

If the tax rate is 50%, cost of capital is 15% and the scrap value of the machine is zero, calculate the net present value and suggest whether the project should be accepted or not.

Given : The present value factor at a discount @ 15% rate are :

Year :	1	2	3	4	5
PV Factors :	0·8696	0·7561	0·6575	0·5718	0·4972

Ans. NPV = ₹ 2,699

21. Subha Ltd. wants to undertake a project which requires a plant costing ₹ 2,00,000. The effective life of the plant is 5 years and its scrap value will be 10% after 5 years. The following cash inflows will be occurred from the project in the next 5 years :

Year	Cash Inflows ₹
1st	40,000
2nd	60,000
3rd	72,000
4th	80,000
5th	68,000

If the cost of capital is 15%, calculate the NPV of the project :

Given :

Year :	I	II	III	IV	V
PVF at 15% :	0·8696	0·7561	0·6575	0·5718	0·4972

Ans. NPV = ₹ 16,987

22. A company is considering an investment project which requires an initial cash outlay of ₹ 6,00,000 on equipment. The project's economic life is 10 years. An additional investment of ₹ 2,40,000 would also be necessary at the end of each two years to restore the efficiency of the equipment. The annual cash inflows which are expected from the project are as follows :

Year :	1	2	3	4	5	6	7	8	9	10
Cash inflows : (₹ in lakh)	0·96	1·32	1·92	2·16	3·00	3·60	4·56	4·8	5·52	6·00

If the scrap value of the equipment is zero after 10 years and the cost of capital is 20%, justify whether the project should be accepted or not by determining the net present value.

Given :

Year :	1	2	3	4	5	6
PVF at 20% :	0·833	0·694	0·579	0·482	0·402	0·335
	7	8	9	10		
	0·279	0·233	0·194	0·162		

Ans. NPV = ₹ 52,848

23. Globe Traders Ltd. is considering an investment project which requires a machine costing ₹ 6,00,000 and an additional amount of ₹ 60,000 as working capital. The project is expected to yield annual (before tax) cash inflow of ₹ 90,000. It is estimated that the project will have a life of 10 years, at the end of which it will have a scrap value of ₹ 1,20,000. If the cost of capital is 10% and the present value of annuity of ₹ 1 at 10% rate of discount for 10 years is ₹ 6.14 and the present value of ₹ 1, received at the end of 10th year is ₹ 0.39, calculate the net present value of the project and suggest whether the project should be accepted by the company or not. Assuming that the company is in the tax bracket of 50%.

Ans. (–) ₹ 18,780

24. Nabanita Ltd. is considering an investment project which requires a machine costing ₹ 4,00,000, and ₹ 1,00,000 as working capital. The working life of the project is 10 years but at the end of 5th year, an additional amount of ₹ 50,000 will be required as additional working capital. The project is expected to yield annual (before tax) cash inflows of ₹1,00,000. The scrap value of the machine will be ₹ 40,000 at the end of 10th year. If the cost of capital is 12% and tax rate is 50%, determine the NPV of the project and determine whether the project should be accepted or not.

Given :

(i) Present value of annuity of ₹1 at a discount @ 12% for 10 years is ₹ 5.650.
(ii) Present value of ₹ 1 at a discount @ 12% for 5 years is ₹ 0.567.
(iii) Present value of ₹ 1 at a discount @ 12% for 10 years is ₹ 0.322.

Answer
NPV = ₹ 18,730, PV of cash outflows = ₹ 5,28,350, and PV of cash inflows = ₹ 5,47,080