11.1. The expected cash flows of a project are as follows:

Year	Cash flow
0	−1,00,000
1	20,000
2	30,000
3	40,000
4	50,000
5	30,000

The cost of capital is 12%.

(a) Calculate the payback period.

(b) Calculate the discounted payback period.

Year	Cashflows	Cumulative cash flows
1	20,000	20,000
2	30,000	50,000
3	40,000	90,000
4	50,000	1,40,000
5	30,000	1,70,000

Since, the ~~cumulative~~ initial investment lies between 90,000 (3 years) and 1,40,000 (4 years) the payback period by interpolation

~~= 3 + 1,40,000 - 4,00,000~~

= 3 + 1,40,000 -

$$= 3 + \frac{1,00,000 - 90,000}{1,40,000 - 90,000}$$

$$= 3 + \frac{10,000}{50,000}$$

$$= 3 \cdot 2 \text{ years.}$$

Year (t)	Cash flows (C_t)	$\frac{1}{(1+r)^t}$	Discounted cash flows $\left(\frac{C_t}{(1+r)^t}\right)$	Cumulative discounted cash flows
1	20,000	0·893	17,860	17,860
2	30,000	0·797	23,910	41,770
3	40,000	0·712	28,480	70,250
4	50,000	0·636	31,800	1,02,050
5	30,000	0·567	17,010	1,19,060

Since, the initial investment lies between 70,250 (3 years) and 1,02,050 (4 years) the payback period by interpolation

$$= 3 + \frac{1,00,000 - 70,250}{1,02,050 - 70,250}$$

$$= 3 + \frac{29,750}{31,800}$$

$$= 3 + 0 \cdot 94$$

$$= 3 \cdot 94 \text{ years.}$$

Q. The following data is available for a project:

Year	Book value of investment	Profit after tax
1	Rs. 90,000	Rs. 20,000
2	Rs. 80,000	Rs. 22,000
3	Rs. 70,000	Rs. 24,000
4	Rs. 60,000	Rs. 26,000
5	Rs. 50,000	Rs. 28,000

Calculate the accounting rate of return.

Solution: Average annual post-tax profit

$$= \text{Rs.} \frac{(20,000 + 22,000 + 24,000 + 26,000 + 28,000)}{5}$$

$$= \text{Rs } 24,000$$

Average book value of investment

$$= \text{Rs.} \frac{(90,000 + 80,000, 70,000 + 60,000 + 50,000)}{5}$$

$$= \text{Rs } 70,000$$

Accounting rate of return

$$= \frac{\text{Average annual post-tax profit}}{\text{Average book value of investment}}$$

$$= \frac{24,000}{70,000} = 34.29\%.$$