Question

You consider buying a business for R600 000. The business is expected to run for 5 years and the following net returns are expected.

Year 1- R160 000

Year 2- R250 000

Year 3- R190 000

Year 4- R180 000

Year 5- R130 000

Should you buy the business? A project of this type is expected to return at least 11% per annum. (Show details of your calculation).

Solution

We should buy the business if NPV of this project is greater or equal to 0.

Formula: $NPV = CF0 + \frac{CF1}{(1+r)^{\wedge}1} + \frac{CF2}{(1+r)^{\wedge}2} + \frac{CF3}{(1+r)^{\wedge}3} + \frac{CF4}{(1+r)^{\wedge}4} + \frac{CF5}{(1+r)^{\wedge}5}$,   where

CF_0= - 600000

CF_1= 160 000

CF_2= 250 000

CF_3= 190 000

CF_4=180 000

CF_5=130 000

r=0.11 (11%)

The calculation of PV for 5 years is shown in the table below.

Year, (t)	Net Returns CF(t),R	Present Value of annual returns, PV(t),R	Formula for PV in year t (discount rate= r= 11.00%) $PV(t) = \frac{CF(t)}{(1+r)^{\wedge}t}$
1	160000	144144.1441	PV(1)=$\frac{160000}{(1+0.11)^{\wedge}1}$
2	250000	202905.6083	PV(2)=$\frac{250000}{(1+0.11)^{\wedge}2}$
3	190000	138926.3624	PV(3)=$\frac{190000}{(1+0.11)^{\wedge}3}$
4	180000	118571.5753	PV(4)=$\frac{180000}{(1+0.11)^{\wedge}4}$
5	130000	77148.6726	PV(5)=$\frac{130000}{(1+0.11)^{\wedge}5}$
Sum		681696.3629	PV$_{1-5}$ = $\sum_{t=1}^{5} PV(t)$

$$NPV = CF0 + \frac{CF1}{(1+r)^\wedge 1} + \frac{CF2}{(1+r)^\wedge 2} + \frac{CF3}{(1+r)^\wedge 3} + \frac{CF4}{(1+r)^\wedge 4} + \frac{CF5}{(1+r)^\wedge 5} = -600000 + 681696.36 = 81696.36$$

Answer: Since NPV=81696.36>0, we should buy this business.