HW 2.2(a) Key

1. Deposits of 100 are placed into a fund at the beginning of each year for 12 years. The effective annual interest rate is 9%. Calculate the present value of the series of payments.

A) 780.52 B) 651.63 C) 716.07 D) 844.97 E) 909.41

$$100\,\ddot{a}_{\overline{12}|9\%} = 100(1.09)\,a_{\overline{12}|9\%}$$

$$= 109\,\frac{1-(1.09)^{-12}}{0.09}$$

$$= \boxed{780.52}$$

2. Deposits of 30 are placed into a fund at the beginning of each year for 10 years. The effective annual interest rate is 10%. Calculate the accumulated value of the series of payments at the end of the 10th year.

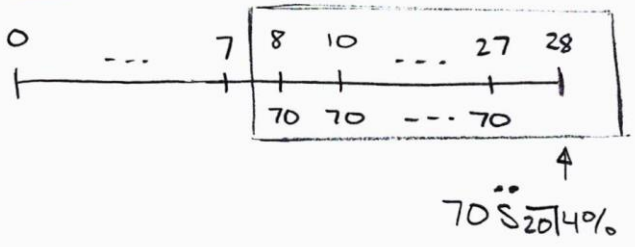
A) 525.94 B) 430.31 C) 478.12 D) 573.75 E) 621.56

$$30\,\ddot{s}_{\overline{10}|10\%} = 30(1.10)\,s_{\overline{10}|10\%}$$

$$= 33\,\frac{(1.10)^{10}-1}{0.10} = \boxed{525.94}$$

3. Deposits of 70 are placed into a fund at the beginning of each year with the first deposit occurring at $t = 8$. The effective annual interest rate is 4%. Calculate the accumulated value of the series of payments at the end of the 28th year.

A) 2,167.84 B) 1,917.71 C) 2,001.09 D) 2,084.47 E) 2,251.22



$70\,\ddot{s}_{\overline{20}|4\%}$

$$70\,\ddot{s}_{\overline{20}|4\%} = 70(1.04)\,s_{\overline{20}|4\%}$$

$$= 72.8\,\frac{(1.04)^{20}-1}{0.04}$$

$$= \boxed{2167.84}$$

4. Deposits of 80 are placed into a fund at the beginning of each year for T years. At an effective annual interest rate is 4%, the present value of the series of payments is 1053.25. Find T.

A) 18 B) 19 C) 20 D) 17 E) 16

$$80\ddot{a}_{\overline{T}|4\%} = 80(1.04)\,a_{\overline{T}|4\%}$$

$$= 83.2\,a_{\overline{T}|4\%} = 1053.25$$

↓ (BA II)

$$\boxed{T = 18}$$

5. Deposits of P are placed into a fund at the beginning of each year for 14 years. At an effective annual interest rate is 4%, the present value of the series of payments is 943.01. Find P.

A) 85.84 B) 82.41 C) 89.27 D) 92.71 E) 96.14

$$P\ddot{a}_{\overline{14}|4\%} = 943.01$$

$$P(1.04)\,\frac{1-(1.04)^{-14}}{0.04} = 943.01$$

$$P(10.9856) = 943.01$$

$$P = \boxed{85.84}$$