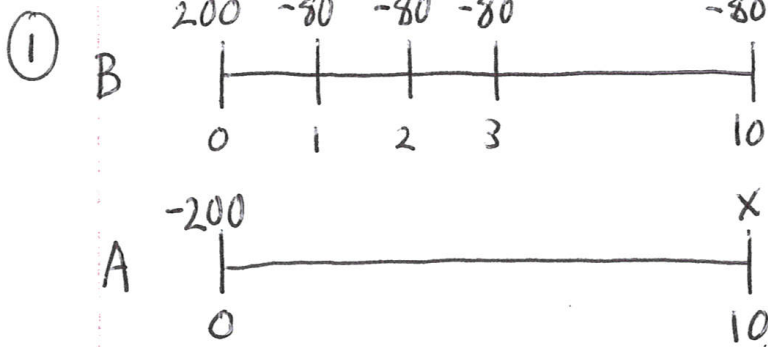


EXAM 1 PRACTICE EXAM



$$\boxed{CF} \ -200 \boxed{ENTER} \downarrow 80 \boxed{ENTER} \downarrow$$

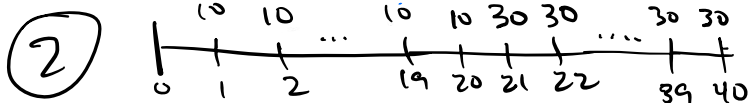
$$3 \boxed{ENTER} \downarrow 0 \boxed{ENTER} \downarrow 6 \boxed{ENTER}$$

$$\downarrow 80 \boxed{ENTER} \boxed{IRR} \boxed{CPT} = 15.51$$

$$X = 80(1.05^9 + 1.05^8 + 1.05^7 + 1) = 434.87$$

$$\left(\frac{434.87}{200}\right)^{1/10} - 1 = 0.080769$$

$$15.51 - 8.0769 = \boxed{7.433}$$



$$10a_{\overline{20}|} + v^{20}(30)a_{\overline{20}|} = \boxed{265.53}$$

③

$$100 \left(1 + \frac{.06}{4}\right)^{4(15.25)} = 50 e^{\int_0^{15.25} \delta dt}$$

$$247.9868 = 50 e^{15.25\delta}$$

$$\ln\left(\frac{247.9868}{50}\right) = 15.25\delta$$

$$\delta = \boxed{0.105}$$

④

$$125(1-.04)^{-t_1} = 150 \quad t_1 = 4.466$$

$$150(1-.05)^{-t_2} = 200 \quad t_2 = 5.609$$

$$200(1-.06)^{-t_3} = 225 \quad t_3 = 1.904$$

$$t_1 + t_2 + t_3 = \boxed{11.98}$$

⑤

$$\frac{110}{0.04} = 2750 = \frac{100}{1.04} \ddot{a}_{\overline{50}|j}$$

$$j = 0.02586 = \frac{.04 - g}{1+g}$$

$$g = \boxed{0.01378}$$

$\boxed{N} = 50 \quad \boxed{PV} = 2750$ * BGN mode
 $\boxed{PMT} = -96.15 \quad \boxed{FV} = 0 \quad \boxed{F/Y} = CPT = 2.586$

⑥

$$100 \exp\left(\int_2^7 (0.01 + 0.001t + 0.0001t^2) dt\right)$$

$$= 100 \exp\left(0.01t + 0.0005t^2 + 0.000025t^3 \Big|_2^7\right)$$

$$= 100 \exp(0.154525 - 0.0224) = \boxed{114.125}$$

⑦

$$(1.02)^{1/12} \cdot 20 \ddot{s}_{\overline{121.52}|(1.02)^{1/6} - 1} = 3000 \quad \boxed{F/Y} = 0.33059 \quad \boxed{PV} = 0 \quad \boxed{PMT} = -20$$

Two month periods
 $\boxed{FV} = 2995.053 \quad \boxed{N} = CPT = 121.52$
 $\hookrightarrow 121.52(2) = \boxed{243.046}$

⑧

$$\frac{20}{.06} = X a_{\overline{10}|.06} \quad \boxed{PV} = 333.33 \quad \boxed{N} = 10 \quad \boxed{F/Y} = 6 \quad \boxed{FV} = 0 \quad \boxed{PMT} = CPT = \boxed{45.289}$$

(After 7 payments a perpetuity is still a perpetuity.)

⑨ $(1.04)^{45} \cdot 10 a_{\overline{30}|.04} = (1.04)^{15} \cdot 10 s_{\overline{30}|.04} = \boxed{1010.06}$
 $N=30$ $F/Y=4$ $PMT=-10$ $PV=FV=0$ CPT PV or FV

⑩ $20(v^5 + v^{15}) = 45v^{15}$ (11) $100 + \frac{100}{1+i} = \frac{1}{i}$
 $\frac{v^5}{v^{15}} + \frac{v^{15}}{v^{15}} = \frac{45}{20}$ $100 \left[1 + \frac{1}{1+i}\right] = \frac{1}{i}$
 $\frac{1}{v^{10}} + 1 = \frac{45}{20}$ $100 \left[\frac{1+i}{1+i} + \frac{1}{1+i}\right] = 100 \left[\frac{2+i}{1+i}\right] = \frac{1}{i}$
 $v = 0.97793 = \frac{1}{1+i}$ $100 = \left[\frac{1+i}{2+i}\right] \frac{1}{i} = \frac{1+i}{2+i i^2}$ $i = \frac{-199 \pm \sqrt{199^2 + 408}}{200}$
 $i = \boxed{0.022565}$ $100 i^2 + 200i - i - 1 = 0$ $= \boxed{0.0050125}$

⑫ A: $0.5(2000)(1.07^5 - 1) = 402.55$
 $2402.55(1.07)^{11} = 5057.0157$ $5057.0157 - 3369.7031 =$
 $2402.55(1.07)^5 = 3369.7031$ 1687.3126
 $3369.7031(1.07)^4 = 4416.99$
 B: $(402.55(1 + \frac{.02}{4})^{4 \cdot 11} + 1687.3126) \left(1 + \frac{.002}{4}\right)^{4 \cdot 4} = 2370.46$
 Diff: $4416.99 - 2370.46 = \boxed{2046.53}$

⑬ $\frac{100}{\frac{.08}{1.08}} = X(1.08)^8$ $X = \boxed{729.363}$

⑭ $\frac{X}{i} = X a_{\overline{n}|i} + X a_{\overline{n}|i} v^n + \frac{X}{i} v^{2n}$
 Total Ernie Colleen Jeff

$0.4 \frac{X}{i} = X a_{\overline{n}|i} = X \left(\frac{1-v^n}{i}\right)$ $.4 = 1 - v^n$ $.6 = v^n$

$\frac{X}{i} = \frac{X}{i} (1 - v^n) + \frac{X}{i} (1 - v^n) v^n + \frac{X}{i} (v^n)^2$

$1 = 0.4 + 0.4(0.6) + (0.6)^2$ Jeff has $0.6^2 = \boxed{0.36}$

⑮ $21,092.04 = X a_{\overline{12}|.078} v_{.078}^{11}$ $X = \boxed{6328}$

⑯ $1000 a_{\overline{10}|} + \left(\frac{1000}{i} + \frac{180}{i^2}\right) v^{10} = P$ $i = 0.05$

$7721.73 + 9200(v^{10}) = P = \boxed{64201.75}$

$$(17) (1+i)^n = 2 \therefore v^n = 0.5$$

$$(1+i)^{3n} \cdot 98 a_{\overline{n}|i} + (1+i)^{2n} \cdot 196 a_{\overline{2n}|i} = 8000$$

$$2^3 (98) \left(\frac{1-0.5}{i} \right) + 2^2 (196) \left(\frac{1-0.5^2}{i} \right) = 8000 \quad i = \boxed{0.1225}$$

$$(18) 100 + 200v^n + 300v^{2n} = 600v^{10}$$

$$100 + 200(.76) + 300(.76)^2 = 600(1+i)^{-10} \quad i = \boxed{0.035017}$$

$$(19) X(1+i)i = \frac{X}{2}$$

$$(1+i)i = \frac{1}{2}$$

$$i + i^2 - \frac{1}{2} = 0$$

$$i = \boxed{0.366}$$

$$(20) \begin{array}{c} -3000 \quad 1000 \quad 500 \quad X \\ | \quad | \quad | \quad | \\ 0 \quad 1 \quad 2 \quad 3 \end{array}$$

$$3000 = 1000v + 500v^2 + Xv^3$$

$$X = (3000 - 1000v - 500v^2) (1+i)^3$$

$$\boxed{X = 2072.74}$$