ACT SCI 2053

[redacted] TEST 1 [redacted]

# PRACTICE 2

V I + 4 [redacted] V I + 2 [redacted]

1 A — to Mar 23, 2011 (Oct 23, 2010) = 151 days; $S = 5000[1+(0.0825)\frac{151}{360}] = 5173.02$

2 B — Oct 23, 2010 to Jan 9, 2011 = 78 days; $r = \frac{I}{Pt} = 86.12 / 5000(\frac{78}{365}) = 0.0806 = 8.06\%$

3 C — $4000[1+(.10)\frac{95}{365}] - 125 = 3979.11$; $3979.11[1+(.10)\frac{85}{365}] = 4071.77 = X$

4 D — $S = 50,000[1+(.15)\frac{5}{12}+(.10)\frac{3}{12}+(.12)\frac{2}{12}] = 15,000(1.1075) = 55,375$

5 A — Jan 23 + 10 months = Nov 23 + 3 days = Nov 26; May 23 to Nov 26 = 187 days

Proceeds, $P = 6402.41[1+(.09)\frac{187}{365}]^{-1} = 6120.21$

6 C — 0, 4, 8, 10; 1500, X, 3000; $X = 3000[1+(.07)\frac{2}{12}]^{-1} - 1500[1+(.07)\frac{4}{12}]$

$= 1430.40$

7 A — $r = \frac{I}{Pt} = \frac{40}{(900-40)4/12} = \frac{40}{860(4/12)} = 13.95\%$

8 D — maturity value $= 10,000[1-(0.10)\frac{93}{365}]^{-1} = \$10,261.46$ = face value

9 C — $10,000[(1.02)^{19/12\times4}+(1.02)^{14/12\times4}+(1.02)^{9/12\times4}] = 10,000[(1.02)^{6.33}+(1.02)^{4.666}+(1.02)^{3}] = 32,916.46$

10 D — (i) $(1+i)^n = 2$ (ii) $1000(1+i)^{+(n-2)} = 1878 \Rightarrow 1000(1+i)^n(1+i)^{-2} = 1878 \Rightarrow 1000(2)(1+i)^{-2} = 1878$

$\Rightarrow 2000(1+i)^{-2} = 1878 \Rightarrow i = 3.20\%$

11 A — $(1+\frac{j_4}{4})^{7.5\times4} = (1+\frac{0.09}{52})^{104}(1+\frac{0.08}{6})^{24}(1.035)^3 = 1.823821696$

$\Rightarrow j_4 = 4[(1.823821696)^{1/30}-1] = 0.08093 = 8.09\%$

12 A — $100(1+\frac{0.18}{12})^{12n} = 2(100)(1+\frac{0.07}{2})^{2n} \Rightarrow (1.015)^{12n} = 2(1.035)^{2n}$

$\Rightarrow \left[\frac{(1.015)^{12}}{(1.035)^2}\right]^n = 2 \Rightarrow n = \frac{\log 2}{\log 1.08444609} = 8.5$ yrs

13 D — I: $j_1 = 12\%$

II $j_1 = (1+\frac{.1155}{4})^4 - 1 = 12.06\%$

III $j_1 = (1+\frac{.1130}{12})^{12} - 1 = 11.904\%$

rate II > rate I > rate III. Thus pv of III > pv of I > pv of II

14 D — $n = 2\text{yrs}\times4 + 8\text{ months} = 10\frac{2}{3} \doteq 11$; $A = 20,000(1.025)^{-11}[1+(.10)\frac{1}{12}] = 15,369.92$

15 B — need $j_4$: $2000(1+\frac{j_4}{4})^{12} = 2500 \Rightarrow i = \frac{j_4}{4} = 0.018769265$

Focal date = Time 0: $2000 = X(1.018769265)^{-3} + 2X(1.018769265)^{-5} \Rightarrow X = \$722.50$

16 A — $[1-d(\frac{30}{12})]^{-1} = (1+\frac{0.08}{12})^{30} \Rightarrow d = 0.07229 = 7.23\%$

17 D — $i^{(2)}$ = rate of growth compounded twice a day $\Rightarrow (1+\frac{i^{(2)}}{2})^{12\times2} = 4 \Rightarrow i^{(2)} = 2[4^{1/24}-1] = 11.89\%$

18 A — $34,000 = 1500\, s_{\overline{16}|.04} + Y = 1500(21.82453)(1.04) + Y = 34,046.27 + Y \Rightarrow Y = -46.27 \doteq 0$

19 B — $a_{\overline{n}|i}(1+i)^n = s_{\overline{n}|i} \Rightarrow (1+i)^n = \frac{221.92}{15.20} = 14.6$

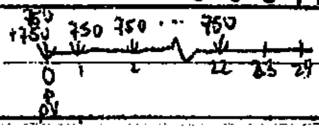
Thus $221.92 = s_{\overline{n}|i} = \frac{(1+i)^n-1}{i} = \frac{14.6-1}{i} \Rightarrow i = \frac{13.6}{221.92} = 0.06128 = 6.13\%$

20 D — Aug 12/10 to Aug 12/16 = 6 yrs × 4 + 1 = 25 payments; Thus, $A = 500\,\ddot{a}_{\overline{25}|.01} = 500\,a_{\overline{25}|.01}(1.01) = \$11,121.69$

21 C — $20,000 = 1600\, a_{\overline{10}|i} \Rightarrow a_{\overline{10}|i} = 12.5$

| $a_{\overline{n}|i}$ | $j_2$ |
|---|---|
| 13.0079 | 0.09 |
| 12.5 | $j_2$ |
| 12.4622 | 0.10 |

$j_2 = 0.09 + (.01)\left[\frac{12.5-13.0079}{12.4622-13.0079}\right] = 9.93\%$

| V i + 4 | | V i + 2 | | |
|---|---|---|---|---|
| 22 | [redacted] | A | [redacted] |  $S = s_{\overline{n-1}\rvert i}$ $\quad s_{\overline{n}\rvert i} = S(1+i)^2 + 1(1+i)$ |
| 23 | [redacted] | B | [redacted] | $S = 800\, s_{\overline{12}\rvert .03}(1.02)^8 + 800\, s_{\overline{8}\rvert .02} = 20,168.95$ |
| 24 | [redacted] | D | [redacted] | payment at time 3 = a.v of (3+1) missed payments + p.v. of payments from time 8 to 20 $= 500\, s_{\overline{4}\rvert .04} + 500\, a_{\overline{13}\rvert .04} = 2123.23 + 4992.82 = \$7116.06$ |
| 25 | [redacted] | D | [redacted] |  $p.v. = 750 + 750\, \ddot{a}_{\overline{23}\rvert i}$ |