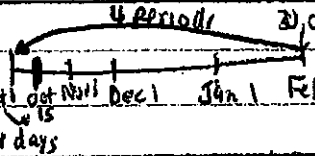
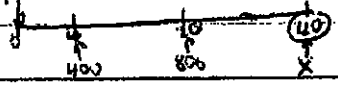
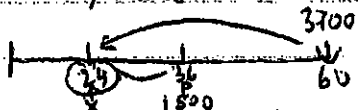
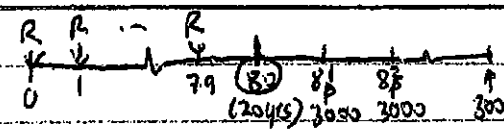
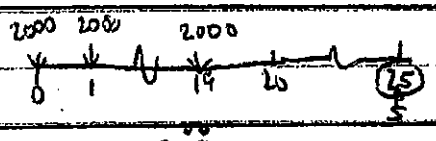
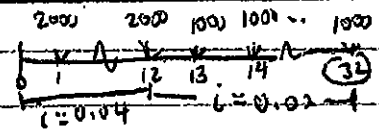
PRACTICE 1

ACTUARIAL SCIENCE 2053 | TEST 1 | [redacted]

Vit H	Vit 2	
1	D	$I = Prt \Rightarrow 488.00 = 12{,}000(0.08)\frac{t}{360} \Rightarrow t = 183$ days $\Rightarrow$ October 3
2	C	$4000\left[1+r\left(\frac{80}{365}\right)\right] = 2000\left[1+r\left(\frac{50}{365}\right)\right]$ [illegible] $+2026.51$ $\Rightarrow$ solves for $r = \frac{26.51}{602.73418} = 4.40\%$
3	D	$\left[1-d\left(\frac{200}{365}\right)\right]^{-1} = 1+(.08)\frac{200}{365} \Rightarrow$ solves for $d = 7.66\%$.
4	A	Discount $= 5000(0.03) = 150$ Need to borrow $= 5000-150 = 4850 \Rightarrow I = 4850(.18)\frac{70}{365} = 167.42$ } lose $17.42
5	A	$P = 20{,}769.32\left[1-(0.08)\frac{105}{365}\right] = 20{,}291.34$ June 26 (179) to Oct 6 (279) $= 102$ days $+3$ days of grace $= 105$
6	C	Due date amount $= 20{,}000\left[1+(.09)\frac{153}{365}\right] = 20{,}754.52$ May 6 (126) to Oct 6 (279) $= 153$ days $I = 20{,}754.52 - 20{,}419.16 = 335.36 \Rightarrow r = \frac{335.36}{20{,}419.16(61/365)} = 9.83\%$.
7	B	$60{,}000\left[1+(.16)\frac{20}{365}\right] - 20{,}000 = 40{,}526.03$ $40{,}526.03\left[1+(.16)\frac{40}{365}\right] - 1500 = 39{,}736.62$ Final Balance $= 39{,}736.62\left[1+(.16)\frac{25}{365}\right] = 40{,}172.09$
8	D	$5000 = 15{,}000\left(1+i^{(4)}_{1/4}\right)^{-186/3} \Rightarrow (1+i)^{1.62} = \frac{15}{5} = 3 \Rightarrow i^{(4)}_{1/4} = 4\left[(3)^{1/62}-1\right] = 7.15\%$
9	A	 $A = 30{,}000(1.01)^{-4}\left[1+(0.12)\frac{14}{365}\right] = 28{,}962.10$
10	D	$\left(1+i^{(4)}_{1}\right)^{8} = \left(1+\frac{0.08}{6}\right)^{6\times 3}\left(1+\frac{0.06}{12}\right)^{12\times 3}\left(1+\frac{0.05}{2}\right)^{2\times 2} \Rightarrow i^{(4)}_{1} = 6.67\%$.
11	B	$\left(1+i^{(1)}_{1}\right)^{12} = 2 \Rightarrow 1+i^{(1)}_{1} = 2^{\frac{1}{12}} = 1.059463094$ Thus, $1500\left(1+i^{(1)}_{1}\right)^{n} = 2200 \Rightarrow n = \frac{\ln(1.4666)}{\ln(1.059463094)} = 6.63$ years
12	B	 $1000(1.03)^{40} = 400(1.03)^{36} + 800(1.03)^{20} + X$ $\Rightarrow X = 657.89$
13	C	End of 4 years $= 25{,}000\left(1+\frac{0.07}{4}\right)^{4}(1.03)^{2}\left(1+\frac{0.03}{6}\right)^{12} = 30{,}181.78$ } difference End of 3 years $= 25{,}000(1.0175)^{4}(1.03)^{2}(1.005)^{6} = 29{,}291.96$ } $= 889.82$
14	A	Maturity value of loan $= 2500(1.04)^{10} = 3700.61$  $3700.61(1.005)^{-36} = 1500(1.005)^{-12} + X$ $\Rightarrow X = 1679.54$
15	A	Pop 31/2000 $= 664{,}735(1.03)^{3}(1.04)^{-5} = 500{,}000$
16	C	Timoo is Sept 28/09 to Oct 28, 2012 is 3 yrs + 1 months $= 37$ payments $\Rightarrow A = 250\,a_{\overline{37}|.005} = 8425.63$

V 1+4	V 2+3	V 1+2	V 3+4	
22		C		 Focal Date = Time 80 $R\,s^{50}_{\overline{80}|.015} = 3000\,a_{\overline{60}|.01}$ DUE Ordinary
18		B		 $S = 2000\,s_{\overline{20}|.05}(1.05)^6$ $= 66131.9082(1.05)^6 = 88,623.08$
19		D		$17{,}000 = R\,\ddot{s}_{\overline{n+1}|i}$ $= R[s_{\overline{n+1}|i} - 1] = R[33.06596 - 1] \Rightarrow R = \frac{17{,}000}{32.06596} = 530.16$
20		A		$3850 = 200 + R\,a_{\overline{24}|.0075}(1.0075)^{-2}$ $\Rightarrow R = (3850 - 200)/a_{\overline{24}|.0075}(1.0075)^{-2} = \$169.26$
21		D		 $S = 1000\,s_{\overline{20}|.02} + 2000\,s_{\overline{12}|.04}(1.02)^{20} = 68,952.48$
17		B		$A = 350\,a_{\overline{60}|.023/12} = 350\,a_{\overline{60}|.0025}(1.0025) = 19,527.02$