I. Accounting for Bonds

(a)

Date	Cash (A) + ... =	Notes Payable (L)	+ Interest Payable (L)	+ ... + Retained Earnings (E)	*Reason*
Dec 1	+50,000	+ 50,000			
Dec 31			+250	(250)	Interest expense
Jan 30			+250	(250)	Interest expense
Jan 30*	(500)	(50,000) +50,000	(500)		Interest payment Replace old note with new
Mar 2	(50,250)	(50,000)		(250)	Interest expense

Note: Omitting the entries to *Notes Payable* on 1/30 is also acceptable.

(b)

Date	Cash (A) + ... =	Notes Payable (L)	+ Interest Payable (L)	+ ... + Retained Earnings (E)	*Reason*
Dec 31			+250	(250)	Interest expense
Jan 30 (1)	(50,500)	(50,000)	(250)	(250)	Interest expense
Jan 30 (2)		(50,000) +50,500	(500)		Replace old note with new

II. Present Value Calculations

Note: when bonds pay, and compound, interest semi-annually, the convention is to divide the annual coupon rate in half (i.e., from 8% to 4%), as well as the annual effective rate from (i.e., from 6% to 3%) and to double the number of periods (i.e., 20 years become 40 half-year periods).

PVF = Present Value Factor for $1
PVFA = Present Value Factor for $1 Annuity

(a) PV of Principal
$8,000,000 × PVF(3%, 40 periods)
$8,000,000 × .30656 (Table 4 or $1/1.03^{40}$) = $2,452,480

PV of coupon interest payments
$320,000 × PVFA(3%, 40 periods)
$320,000 × 23.11477 (Table 5 or $1/0.03 – 1/0.03(1.03^{40})$) 7,396,726
Issue Price.. $9,849,206

(b) Interest expense =market interest rate × net bond payable = .03 × $9,849,205 = $295,476.

(c) Net bond payable after 6 months = issue price – payments + interest expense
= $9,849,206 – $320,000 + $295,476 = $9,824,682
Interest expense = market interest rate × net bond payable = .03 × $9,824,682 = $294,740.

(d) Book Value after one year:
= Net bond payable after 1 year = issue price – payments + interest expense
= 9,824,682 – $320,000 + $294,740 = $9,799,422.

Explanatory note: These bonds were issued at a premium. That is, because the coupon rate of 4% > effective interest rate of 3%, the market value at time of issuance > Par value. Thus, interest expense < coupon payment, because each semi-annual payment returns a part of the principal that was borrowed up front.

III. Inferring bond contract parameters from bond disclosures

a. A zero coupon bond's book value will increase by the amount of interest expense, so interest of zero coupon is (165-150) = 15 in 1996. Thus, the interest rate of the zero coupon is 15/150 = 10%

In 1995, the same 10% effective interest rate applies. Assuming that the bond was issued prior to 1995 (no other information is given), the bond value would have been 150 / 1.1 = 136.36 at the end of 1994, so the interest expense is 150 – 136.36 = 13.64.

The interest of the debenture bond is 0.10 × 250 = 25 in 1992 and 1991

➔Interest expense, 1995 = 13.64+ 25 = 38.64
➔Interest expense, 1996 = 15 + 25 = 40

b. We need to assume that the principal will be paid at the <u>end</u> of 2010, 14 years after then end of 1996. The principal amount of the zero-coupon is the amount required to be paid at maturity, which equals the future value at the end of 2010.
$FV_n = PV_0 \times (1+r)^n$
$FV_{14} = 165 \times 1.10^{14} = 626.59$

The principal amount of the 10% debenture, since issued at par, is 250

c. With the extra information given, we do not have to assume anything about the date of issuance or maturity (unlike a and b above). We know that the BV of the bond on Dec. 31, 1995 is 150, and the BV at issuance is 139.53. Thus, the interest accrued in that period is 150-139.53 = 10.47. Since we know that a full year of interest (see a) is 13.64, 10.47 is 0.77 years, or 9.2 months. Going back 9.2 months from Dec. 31, 1995, the bond must have been issued sometime in March.

d. The BSE entry is:

Cash	=	Long-term Bonds	+	RE
-240		-250		10

Economic gain is 10 because an obligation of $250 was fulfilled for only $240.

IV. Accounting for Capital Lease

a. The initial balance sheet value of the equipment and the initial leasehold obligation both equal the present value of the lease payments.

PV of lease payments = $30,000 × PVFA (8%, 5)
= $30,000 × 3.99271 [from Table 5 in Appendix B or $1/0.08 – 1/0.08(1.08^5)$]
= $119,781.30

Date	Balance Sheet Value of Equipment[a]	Leasehold Obligation[b]	Interest Expense[c]	Depr. Expense[d]	Total Expense
1/1/99	$119,781.30	$119,781.30			
12/31/99	95,825.04	99,363.80	$9,582.50	$23,956.26	$33,538.76
12/31/00	71,868.78	77,312.91	7,949.10	23,956.26	31,905.36
12/31/01	47,912.52	53,497.94	6,185.03	23,956.26	30,141.29
12/31/02	23,956.26	27,777.78	4,279.84	23,956.26	28,236.10
12/31/03	(0.00)	(0.00)	2,222.22	23,956.26	26,178.48
Total			$30,218.70	$119,781.30	$150,000.00[e]

a Balance Sheet Value of Equipment = Value of Equipment on 1/1/99 – Accum. deprec.

b Leasehold Obligation = Leasehold Obligation at Beginning of the Period – ($30,000 Lease Payment – Interest Expense for the Period)

c Interest Expense = Leasehold Obligation at Beginning of the Period × 8%

d Depreciation Expense = $119,781.30 ÷ 5 years

e Total has penny discrepancy due to rounding to even cents throughout lease term.

b. Total Rent Expense = Annual Rent Payments × Number of Years of the Lease
= $30,000 × 5 years
= $150,000

c. If the lease is treated as a capital lease, total expenses would be $150,000 [from part (a)]. If the lease is treated as an operating lease, total expenses would still be $150,000 [from part (b)].

Although total expenses over 5 years would be the same under either approach, expenses are higher under the capital lease compared with rental expense for the first 3 years.

Also, a capital lease allocates the $150,000 between interest expense and depreciation expense, while with an operating lease, the entire $150,000 is rent expense.

d. The long-term debt to equity ratio would be higher if the lease were treated as a capital lease. This occurs both because of the numerator and the denominator.
Numerator: More debt would be recorded for a capital lease (none under operating lease).
Denominator: Retained earnings would be lower due to higher expenses relative to rent expense recorded.