EXERCISES 21.3.1

Q1. $BV = 4000 - 2 \times 400 = 3200$
i.e, \$3200.

Q2. Scrap value $= 2500 - 1960$
$= 540$
i.e, \$540

EXERCISES 21.3.2

Q1. (a) $BV = 50000 - 5 \times 8000$
$= 10000$
i.e, \$10,000

(b) $BV = 50000 - 5 \times \left(\frac{18}{100} \times 50000\right)$
$= 5000$
i.e, \$5000

Q2. $BV = 300$, let the purchase price be C
then $BV = C - 550 \times t$
for $t = 6$, $BV = 300$
$\therefore 300 = C - 550 \times 6$
$\Leftrightarrow C = 300 + 550 \times 6$
$C = 3600$
i.e, \$3600

Q3. (a) i. $C = \$8000$
ii. $t = 4$ (4yrs).
iii. dep $= 8000 - 2000$
$= 6000$
i.e, \$6000.
iv. Rate $= \frac{-6000}{4} = -1500$
ie, \$1500 per year

v. This is the same as finding the equation of a straight line; $BV = mt + c$
(m: gradient (= rate of depreciation), c: cost price)
$\therefore BV = -1500t + 8000$, $0 \leq t \leq 4$

vi. $t = 3$, $BV = -1500 \times 3 + 8000$
$= 3500$
i.e, \$3500.

(b) i. \$400,000
ii. 8 yrs.
iii. \$400,000
iv. Rate $= \frac{-400,000}{8} = -50000$
$\therefore$ dep. at \$50,000 per yr.
v. $BV = -50000t + 400,000$, $0 \leq t \leq 8$
vi. $t = 3$, $BV = -50000 \times 3 + 400000$
$= 250,000$
i.e, \$250,000.

(c) i. \$250000
ii. 10 yrs
iii. $250000 - 50000 = \$20,0000$
iv. Rate $= \frac{-200000}{10} = -20000$
ie, dep at \$20,000 per yr.
v. $BV = 250000 - 20000t$, $0 \leq t \leq 10$
vi. $t = 3$, $BV = 250000 - 20000 \times 3$
$= 190000$

Q4. dep at 15% of £10000 per yr.

(a) life time: $0 \le t \le 5$.

$t=0$, BV $= 10000$

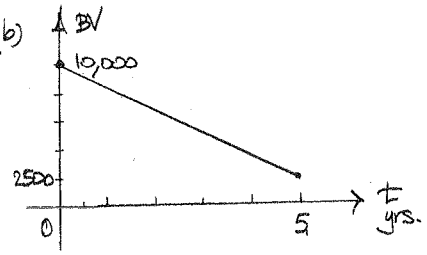
$t=1$, BV $= 10000 - 1 \times \frac{15}{100} \times 10000$
$= 8500$

$t=2$, BV $= 10000 - 2 \times \frac{15}{100} \times 10000$
$= 7000$

[or $8500 - 1500 = 7000$]

t	BV
0	10000
1	8500
2	7000
3	5500
4	4000
5	2500

(b)



(c) Scap value = $2500

(d) rate $= \frac{2500 - 10000}{5} = -1500$

$\therefore$ BV $= 10,000 - 1500t$, $0 \le t \le 5$.

NB: rate of dep. is also found using
15% of 10000 = 1500

Q5. (a) Total cost $= 3 \times 35000$
$= 105000$

Total scrap value $= 7000$

$\therefore$ rate $= \frac{7000 - 105000}{6}$
$= -16,333.33$

ie, dep at $16,333.33 per yr.

(b) $t=0$, BV $= 105,000$

$t=1$, BV $= 105000 - 16333.33$
$= 88666.67$

$t=2$, BV $= 88666.67 - 16333.33$
$= 72333.33$

t	BV (to nearest dollar)
0	105000
1	88667
2	72333
3	56000
4	39667
5	23333
6	7000

(c) see answer in text.

(d) $BV_t = 105000 - \frac{98000}{6}t$, $0 \le t \le 6$

$= 105000 - \frac{49000}{3}t$, $0 \le t \le 6$.

Q6. Printer A: BV $= 2500 - 220t$

$350 = 2500 - 220t$

$\Leftrightarrow t = 9.7727$

Printer B: BV $= 3300 - 300t$

$450 = 3300 - 300t$

$\Leftrightarrow t = 9.5$

$\therefore$ B first, by $9.7727 - 9.5 = 0.2727$ yr
(or by 3 months & 8 days).

EXERCISES 21.3.3

Q1. (a) Reducing balance, then

$BV_t = C\left(1 - \frac{r}{100}\right)^t$

$C = 20000$, $r = 20$

$BV_t = 20000\left(1 - \frac{20}{100}\right)^t$

$= 20000\,(0.8)^t$

Now $\Rightarrow t = 4$, $BV = 20000\,(0.8)^4$

$= 8192$

i.e., \$8192.

(b) $BV_6 = 20000\,(0.8)^6$

$= 5242.88$

i.e., \$5243

Q2. (a) $BV_t = C\left(1 - \frac{r}{100}\right)^t$

$\therefore BV_t = 250000\left(1 - \frac{25}{100}\right)^t$, $0 \le t \le 8$

$= 250000\,(0.75)^t$, $0 \le t \le 8$

Use this equation to construct table.

See answer in book.

(b) see answer in book.

Q3. (a) i. $BV_t = C\left(1 - \frac{r}{100}\right)^t$

$r = 22$ $= 90000\,(0.78)^t$

$C = 90000$ $\therefore BV_1 = 90000 \times 0.78$

$= 70200$

i.e., \$70200

ii. $BV_5 = 90000\,(0.78)^5$

$= 25984.56$

i.e., \$25984.56

(b) $BV_t = 90{,}000\,(0.78)^t$, $0 \le t \le 10$.

(c) $t = 10$, $BV = 90000\,(0.78)^{10}$

$= 7502.1982$

i.e., \$7502.20

Q4. (a) After 1yr, $BV = 15000 - \frac{20}{100} \times 15000$

$= 12000$

After 2yrs, $BV = 12000 - \frac{20}{100} \times 12000$

$= 9600$

After 3yrs, $BV = 9600 - \frac{20}{100} \times 9600$

$= 7680$

After 4yrs $BV = 7680 - \frac{20}{100} \times 9600$

$= 6144$

Schedule:

t	BV
0	15000
1	12000
2	9600
3	7680
4	6144

(b) See answer in text book.

(c) $C = 15{,}000$; $r = 20$

$\therefore BV_t = 15000\left(1 - \frac{20}{100}\right)^t$, $0 \le t \le 4$

$= 15000\,(0.8)^t$, $0 \le t \le 4$.

(d) i. \$9600

ii. $BV_{3.5} = 15000\,(0.8)^{3.5}$

$= 6869.20$

(e) $t = 4$, scrap value = \$6144

Q5. $r = 15$, $BV_5 = 2000$

$\therefore$ Using $BV_t = C\left(1 - \frac{r}{100}\right)^t$

$2000 = C\,(0.85)^5$

$\Leftrightarrow C = \frac{2000}{(0.85)^5} = 4507.496$

i.e., \$4507.50