FIN3701 : May/June 2012 Solutions

Section A

1. *

$$\text{Simple rate of return} = \frac{\text{Net operating income (NOI)}}{\text{Investment}}$$

NOI = Operating revenues - Operating expenses
(Note that this is different from Net Income)

2. (2)

BV = Cost - Acc. Depr.
= 1 000 000 - 3 (0,2 x 1000 000)
= 400 000

3. Gain = SP - BV
= 800 000 - 400 000
= 400 000

Tax = 0,4 x 400 000
= 160 000 ~~tax~~ liability

∴ (3)

4. After-tax proceeds = 800 000 − 160 000
= 640 000

.. (2)

5. Initial investment = Total installed cost of new machine − A-T proceeds from sale of old machine +-ΔNWC

= [(750 000 + 20 000 + 5 000) − (640 000) + (7000)]

= 142 000

6. (2)

Refer to textbook pg. 342

7. (1)

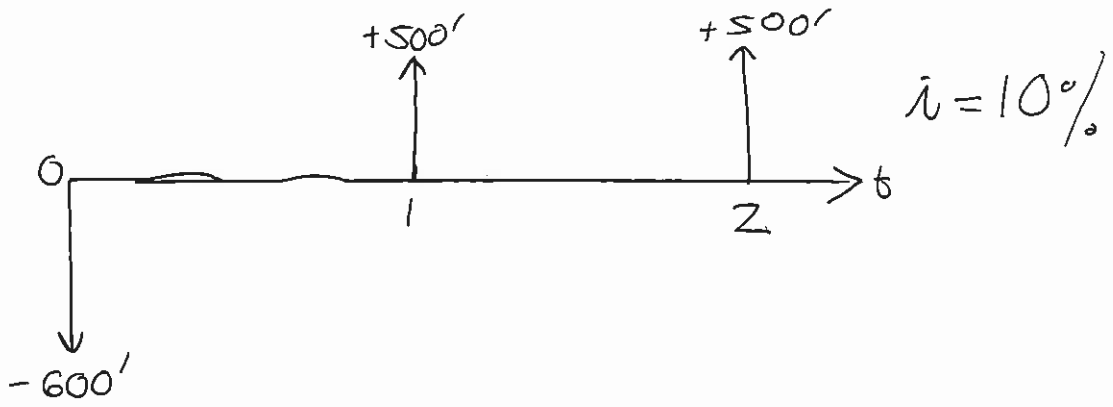
Refer to textbook pg. 353

8. (4)

Refer Table 8.3 pg. 352

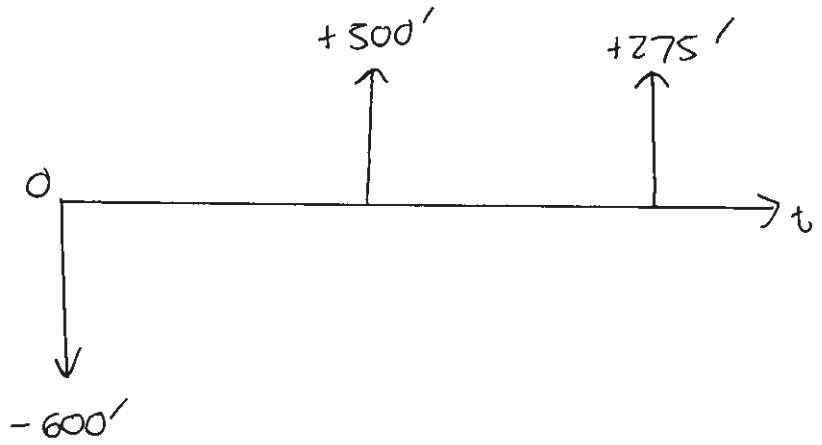
9. ① (Textbook pg. 452)

10. A :



$NPV_A = 267\,768.60$

B :



$NPV_B = 81\,818.18$

∴ ①

11. $NPV_X = 56\,836$

$NPV_Y = 95\,066$

Assuming these projects are independent, select both

$\therefore$ (4)

12. (3) (Higher NPV)

13. To find the level of 'annual' NPV:

X: PV = 56 386
$i = 10$
$N = 3$
Solve for: PMT = 22 674 → Annualised NPV

Y: PV = 95 066
$i = 10$
$N = 3$
Solve for: PMT = 21 828

$\therefore$ (2) (Higher annualised NPV)

14. $CF_0 = -1\,500\,000$

$CF_{1-5} = +400\,000$

$i = 8.7\%$ *

$\Rightarrow NPV = 68\,047,25$

$\therefore$ (1)

* $RADR = Rfr + RI(CoC - Rfr)$

$= 0,06 + 0,9(0,09 - 0,06)$

$= 8,7\%$

15. $CF_0 = -100000\,(1.0) = -100\,000$

$CF_1 = +30\,000\,(0,2) = 6000$

$CF_2 = +40\,000\,(0,4) = 16\,000$

$CF_3 = +50\,000\,(0,6) = 30\,000$

$CF_4 = +9000\,(0,8) = 7200$

$i = 10\% \rightarrow RFR$

$\Rightarrow NPV = -53865,17$

$\therefore$ (3)

16. (3)

17. (4) Textbook pg. 418

18. Risk premium $= r_m - Rfr$

$= 0,07 - 0,025$

$= 0,045$

$= 4.5\%$

$\therefore$ (3)

19. $r_E = Rfr + B(r_m - rfr)$

$= 0,025 + 0,4(0,045)$

$= 4.3\%$

$\therefore$ (2)

20. $r_E = \frac{D_1}{P_0} + g$

$g = \sqrt[2]{\frac{4}{3,20}} - 1$

$= 11,8\%$

$\therefore r_E = \frac{5}{90} + 0,118$

$= 17,36\%$

$\therefore$ (4)

21. $$r_E = \frac{D_1}{P_0 - F} + g$$

$$= \frac{0,09}{50 - (50 \times 0,03)} + 0,06$$

$$= 6,19\%$$

$\therefore$ (2)

22. $$WACC = \left(\frac{D}{D+E}\right) r_d (1-t) + \left(\frac{E}{D+E}\right) r_E$$

$$r_E = \frac{D_1}{P_0} + g$$

Payout $= 100\% \Rightarrow g = 0$ and $D_1 = E_1$

$$\therefore r_E = \frac{1,20}{20} + 0$$

$$= 6\%$$

$$\therefore WACC = (0,8 \times 0,07 \times (1-0,35)) + (0,2 \times 0,06)$$

$$= 4,84\%$$

$\therefore$ (2)

23. (4)

24. $BEP = \frac{FC}{SPU - VCU}$

$= \frac{120\,000}{80 - 50}$

$= 4000$

$\therefore$ (4)

25. $BEP = \frac{FC}{SPU - VCU}$

$= \frac{81\,000}{13 - 9}$

$= 20\,250$

$\therefore$ (4)

26. $E(EPS) = 0,5(1) + 0,3(0,80) + 0,2(1,20)$
$= 0,98 = \overline{X}$

$\sigma^2 = (1 - 0,98)^2 + (0,8 - 0,98)^2 + (1,2 - 0,98)^2$
$= 0,0196$

$\sigma = \sqrt{0,0196}$
$= 0,141 \Rightarrow$ (1)

27. $CV = \frac{\sigma}{\bar{X}}$

$= \frac{0,141}{0,98}$

$= 0,144$

$\therefore$ (2)

28. $k_e = \frac{D_1}{P} + g$

Payout = 100% $\Rightarrow g = 0$; $D_1 = E_1$

$\therefore k_e = \frac{E_1}{P} + g$

$E_1 = E(E_1) = 0,98$

$\therefore k_e = \frac{0,98}{5} + 0$

$= 19,6\%$

(3)

29. FV = 1000

PMT = 1000 (Face value) $\times$ 0,14 (coupon rate) $\times$ 0,5 (Semi-annual) $= 70$

$n = 10 \times 2 = 20$

(10 years; Semi-annual)

$i = 0,12/2 = 6\%$

(YTM; semi-annual)

Solve for PV = 1115

$\therefore$ (4)

30. (2) (since Price of bond > Face/par value)

31. (4)

32. (2) Textbook pg. 545 - 546

33. (4)

34. (1)

35. 400 000 going towards investment w/ 50% debt

$\Rightarrow$ 400 000 → 50% Equity = 200 000, 50% Debt = 200 000

Retained earnings = 310 000 - 200 000

= 110 000 → Dividend

$\therefore$ Retention $= \frac{310' - 110'}{310'}$

$\approx 65\%$

$\therefore$ (4)

36. Warrants do not form part of the syllabus, so you may disregard this question.

Warrants are discussed on pg. 653 - 657

$$TUW = (P_0 - E) \times N$$
$$= (5 - 4) \times 6$$
$$= R6.00$$

∴ (3)

37. (1)

38. (1)

39. (3)

40. $PV = 50\,000$

$i = 24/12$ → Monthly

$N = 2 \times 12$ → Monthly

Solve for PMT = 2644

∴ (2)

Section B

Question 1

This is a badly asked question with a lot of information missing

Therefore, disregard this question

Note that it asks you to calculate NPV and terminal cash flow. Learn about these concepts from SU1 & 2

Question 2

2.1 Total capital under each scenario is:
10 000 x 35 = R350 000 = D+E

A:

Sales	= 530 000
VC	= 0,3(530') = (159 000)
FC	= (251 000)
EBIT	= 120 000
Interest	= (28 000)*
EBT	= 92 000
Tax @ 30%	= (27 600)
EAT	= 64 400

No. shares outstanding : 6000#

EPS = R10,73 →

* Interest: 40% debt ⇒ $D/D+E = 0,4$

$D/350' = 0,4$

$\therefore D = 140\,000$

Int. expense = Int. rate x Value of debt
= 0,20(140000)
= 28000

# No. shares outstanding: Total capital = 350 000
D = 140 000
⇒ E = 350' - 140'
= 210 000

At R35 per share, this implies:
$\frac{210'}{35}$ = 6000 shares outstanding

B:

Sales	= 530 000
VC	= 0,3 (530') = (159 000)
FC	= (251 000)
EBIT	= 120 000
Interest	= (31500)*
EBT	= 88 500
Tax @ 30%	= (26 550)
EAT	= 61950
No. shares outstanding	= 5000#
EPS	= 12,39 →

* Interest expense : $D/D+E = 0,5$

$\Rightarrow D = 0,5\,(350\,000)$

$= 175\,000$

Int. expense = Int. rate x Value of debt

$= 0,18\,(175000)$

$= 31500$

\# No. shares outstanding : $D = 175\,000$

$\Rightarrow E = 175\,000$ (for $D+E = 350'$)

At R35 per share, this equates to:

$\frac{175\,000}{35} = 5000$ shares outstanding

∴ Choose capital structure B since it offers higher EPS

2.2. $WACC = (D/D+E)\, r_d(1-t) + (E/D+E)\, r_E$

A : $r_E = \frac{D_1}{P_0} + g$

Payout = 100% $\Rightarrow D_1 = E_1$; $g = 0$

$\therefore r_E = \frac{10,73}{35} + 0$

$= 30,67\%$

$\therefore WACC_A = (0,4)(0,20)(1-0,3) + (0,6)(0,3067)$

$\simeq 24\%$

B : $r_E = \frac{D_1}{P_0} + g$

Payout = 100% $\Rightarrow D_1 = E_1$; $g = 0$

$\therefore r_E = \frac{12,39}{35} + 0$

$= 35,4\%$

$\therefore WACC_B = (0,5)(0,18)(1-0,3) + (0,5)(0,354)$

$\simeq 24\%$

2.3. Firm value and shareholder wealth is maximised when WACC is minimised

But since each alternative results in a WACC of 24% they will have the same effect on shareholder wealth

∴ Indifferent between the two alternatives

2.4. Adding leverage to an all-equity financed company will increase ROE and EPS but at the cost of higher financial risk