FIN3701 - June 2013

Section A

1. CF_0 = Cost of new asset
+ Installation costs
- A-T proceeds from sale of old asset
± ΔNWC

= (200 000)
+ 0
- 0
+ 5000 *
= - 195 000 ⇒ (2)

* ΔNWC = Δ(CA - CL)
= [(3000 + 2000) - (4000 + 6000)]
= -5000 < 0 ⇒ Cash inflow

2. Revenue = $20\,000^{1} + 5000^{2} + 5000^{3}$
= 30 000

Operating costs = $(15\,000^{1} + 1500^{2} + 1500^{3}) - 5000$
= 18 000 - 5000
= 13 000 (with market research costs excluded)

Depreciation = $200/5$
= 40 000

$$\Rightarrow OCF = (30' - 13' - 40')(1 - 0{,}3) + 40'$$

$$= 23\,900 \rightarrow (3)$$

3. (2) is the most correct option

4. It is slightly ambiguous whether depreciation has been added back. Remember:

$$OCF = Nopat + Depreciation$$

The question states: "After-tax cash flows, including depreciation ..."

Therefore, I will assume that the depreciation has been included.

Thus:

$$CF_0 = -220\,000$$

Incremental:

$$CF_1 = (7500 - 6000) = 1500$$
$$CF_2 = (7500 - 5100) = 2400$$
$$CF_3 = (8000 - 6500) = 1500$$
$$CF_4 = 6000$$

$$r = 10\%$$

$$\Rightarrow NPV = -211\,427{,}84$$

(2)

5. Project A : $CF_0 = -500'$
$Cf_1 = 100'$
$CF_2 = 120'$
$Cf_3 = 150'$
$CF_4 = 150'$

$\Rightarrow IRR = 1,48\%$

Project B : $CF_0 = -325'$
$CF_1 = 140'$
$CF_2 = 140'$
$CF_3 = 140'$
$CF_4 = 140'$

$\Rightarrow IRR = 25,97\%$

(4)

6. NPV_A : Cash flows as above
$i = 12 + 2 = 14\%$

$\Rightarrow NPV_A = -129\,886,83$

NPV_B : Cash flows as above
$i = 14\%$

$\Rightarrow NPV_B = 82\,919,72$

$\Rightarrow$ (1)

7. (4)

8. $r = \frac{D_1}{P_0 - F} + g$

$D_1 = E_1 = 6,80$ (All earnings paid out as dividends)

$P_0 = 45$
$F = 5$

$g = \left(\frac{6,80}{5,90} - 1\right) = 15,25\%$

$\Rightarrow r = \frac{6,80}{45-5} + 0,1525$

$= 32,25\%$

$\rightarrow$ (1)

9. $r_p = \frac{D_p}{N_p}$

$= \frac{2,52}{30(1-0,025)}$

$= 8,62\% \Rightarrow$ (4)

10. $r = \frac{D_1}{P_0} + g$

↘ zero flotation costs
i.e. $P_0 = 50 + 8 = 58$

$= \frac{20}{58} + 0,03$

$= 37,48\%$

(4)

11. Break-even point: $\frac{FC}{SP - VC}$

~~(1)~~ (2) (3) & (4) are correct

⇒ (1) is incorrect

12. $BEP_A = \frac{45\,000}{25 - 13,90} = 4054$

$BEP_B = \frac{30\,000}{17,50 - 10} = 4000$

$BEP_C = \frac{90\,000}{29 - 12} = 5294$

(2)

13. You need to calculate the degree of operating leverage for each:

$$OL = \frac{(P-V)X}{(P-V)X - FC}$$

$$OL_A = \frac{(25 - 13{,}90)\,5000}{(25 - 13{,}90)\,5000 - 45\,000}$$

$$= 5{,}29$$

$$OL_B = \frac{(17{,}50 - 10)\,10\,000}{(17{,}50 - 10)\,10\,000 - 30\,000}$$

$$= 1{,}67$$

$$OL_C = \frac{(29 - 12)\,20\,000}{(29 - 12)\,20\,000 - 90\,000}$$

$$= 1{,}36$$

∴ C, B, A

14. Ideally you would want to calculate the degree of financial leverage for each. But since information regarding fixed financing charges is not given, it cannot be calculated.

The next best thing is to look at the standard deviation of EPS:

$$\sigma_A^{EPS} = 0,76$$

$$\sigma_B^{EPS} = 1,138$$

$$\sigma_C^{EPS} = 1,56$$

Therefore C is highest risk, followed by B and then A

15. EBIT = Revenue - VC - FC

= 10 000 (17,50) - 10000 (10) - 30 000

= 45 000

(4)

16. $$V = \frac{EBIT(1-t)}{WACC}$$

$$= \frac{45\,000\,(1-0{,}3)}{0{,}11}$$

$$= 286\,363{,}64$$

(1)

17. 1 200 000 shares outstanding
R1,50 par value per share

3-for-1 split

$\Rightarrow$ 3 600 000 shares outstanding
R0,50 per share

After the split

(4)

18. See Textbook pg. 647

(2)

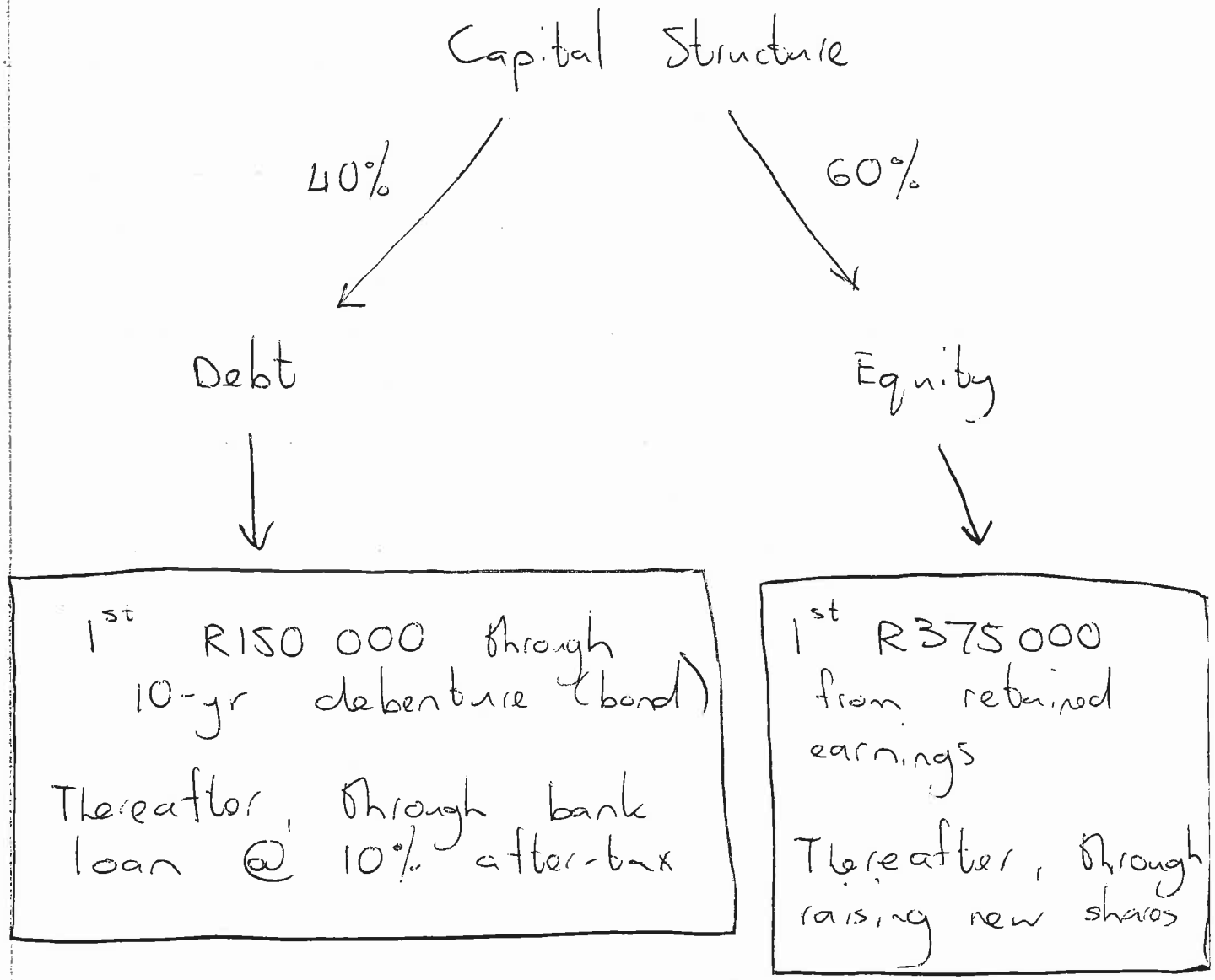
19. (2)

20. (4) - see textbook pg. 697 - 698

Section B

Question 1

1.1



Break - points:

1) When 1st branche of debt has been exhausted:

$$BP = \frac{150\,000}{0{,}4}$$

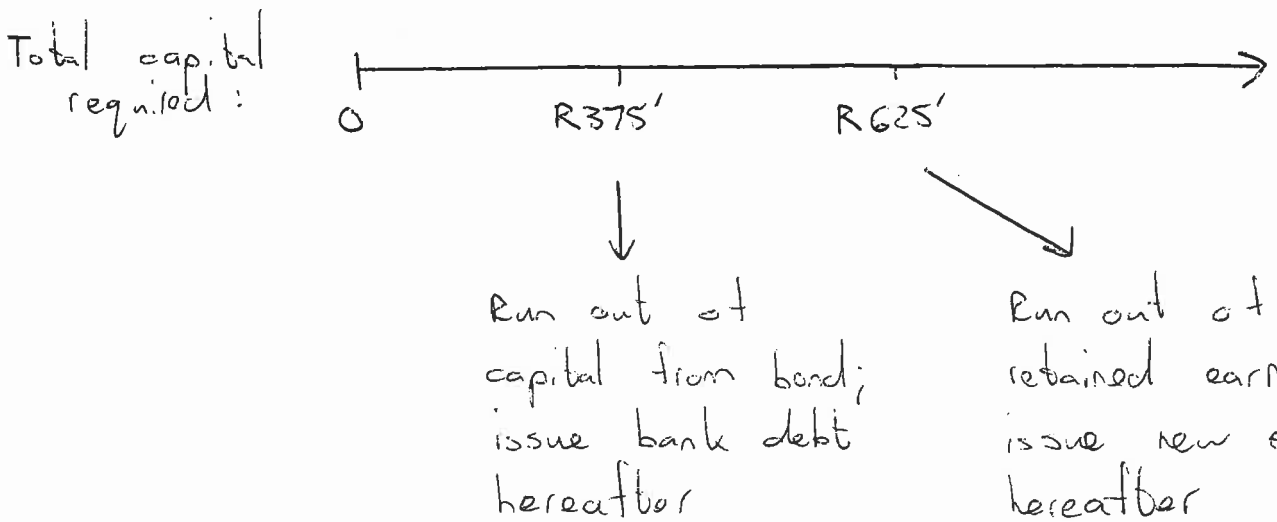
$$= R375\,000 \quad \text{total capital}$$

2) When retained earnings have been exhausted:

$$BP = \frac{375\,000}{0{,}6}$$

$$= R625\,000 \quad \text{total capital}$$

Graphically, this is the situation faced by the company:



Costs of capital for each source:

1) Debenture

FV = 1000
PMT = 80
n = 10
PV = $-[1000(1-0,05) - 20] = -930$
... and solve for i

Discount — Flotation cost

$\Rightarrow i = 9,1\ \%$

2) Bank debt

10% after-tax interest rate

3) Retained earnings

$$r_{re} = \frac{D_1}{P_0} + g$$

$$= \frac{10}{90} + 0,03$$

$$= 14,11\ \%$$

4) New equity

$$r_e = \frac{D_1}{P_0 - F} + g$$

$$= \frac{10}{87,30} + 0,03$$

$$= 14,45\ \%$$

Now to calculate WACC around the break-points:

1) Total capital $0 \rightarrow 375'$:

$$WACC = w_D r_D(1-t) + w_E r_E$$

$$= 0,4\,(0,091)(1-0,3) + 0,6\,(0,1411)$$

$$= 11,01\ \%$$

2) Total capital $375' \rightarrow 625'$:

$$WACC = w_D r_D(1-t) + w_E r_E$$

$$= 0,4\,(0,10) + 0,6\,(0,1411)$$

$$= 12,47\ \%$$

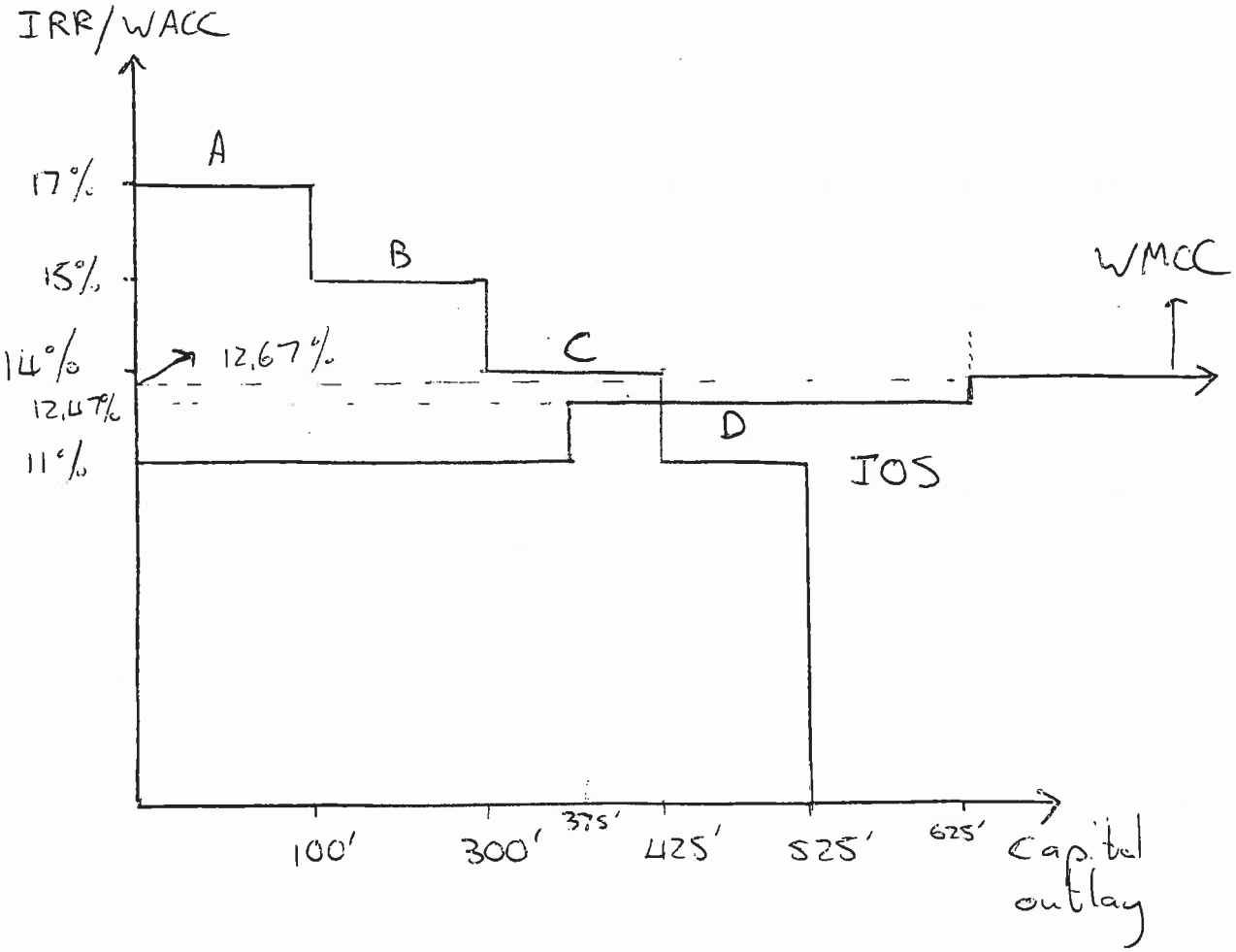
3) Total capital 625' → ∞

$$WACC = w_D r_D(1-t) + w_E r_E$$

$$= 0,4(0,10) + 0,6(0,1445)$$

$$= 12,67\%$$

1.2.



⇒ Accept A, B and C because their IRRs are above the cost of capital

Reject D because its IRR is below the cost of capital

Question 2

- No indication of what the existing machine would otherwise be sold for at $t=5 \Rightarrow$ zero cash flow

- New machine will be worth zero at $t=5 \Rightarrow$ zero cash flow

- NWC at $t=0$

$$= CA - CL$$
$$= 30' - 80'$$
$$= -50' < 0 \Rightarrow$$ Cash inflow of R50 000 at $t=0$

Assuming NWC will be recovered at $t=5$:

$\Rightarrow$ Cash outflow of R50 000 at $t=5$

All considered, the only cash flow in the terminal year (=Year 5) is the reversal of NWC

$\therefore$ TCF $= -50\,000$

Question 3

3.1. 1) 30% Debt → 70% Equity

⇒ 0,7 (500') = 350' from equity

And 0,7 (35') = 24 500' retained earnings

⇒ 350' − 24 500 = 325 500

↓

To be raised from issuing shares

325 500 / 60 = 5425 shares issued

2) 40 % Debt ⇒ 60% Equity

⇒ 0,6 (500') = 300' from equity

0,7 (28') = 19600 retained earnings

⇒ 300' − 19600 = 280 400 to be raised from issuing shares

280 400 / 60 = 4674 shares issued

3) 50% Debt → 50% Equity

⇒ 0,5 (500') = 250' from equity

0,7 (20') = 14 000 retained earnings

⇒ 250' − 14' = 236' to be raised

⇒ 236'/60 = 3934 shares to be issued

3.2. 1) $EPS = \frac{35\,000}{5425} = R\,6,45$

2) $EPS = \frac{28000}{4674} = R\,5,99$

3) $EPS = \frac{20\,000}{3934} = R\,5,08$

3.3. 1) $DPS = \frac{0,3(35000)}{5425} = R1,94$

2) $DPS = \frac{0,3(28000)}{4674} = R1,80$

3) $DPS = \frac{0,3(20000)}{3934} = R1,53$

3.4. Option 2 (40% Debt)

It gives the highest EPS/DPS without breaching the 5000 share limit