BMMF5103 - SUGGESTED ANSWERS (MAY 2012)

PART A

Question 1


b)

\[
\begin{array}{|c|c|}
\hline
\text{YR 0:} & \\
\text{cap spdg:} & -90000 \\
\text{NWC:} & -10000 \\
\text{II:} & -100000 \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|}
\hline
\text{YR 1-3:} & \\
\text{sales} & 120000 \\
\text{cost} & 72000 \\
(S-C) & 48000 \\
(S-C)*(1-0.3) & 33600 \\
\text{dep*(0.3)} & 9000 \\
\text{OCF:} & 42600 \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|}
\hline
\text{YR 3:} & \\
+\text{NWC:} & 10000 \\
\text{disp FA:} & \\
\text{MP} & 10000 \\
-TxPrft: & -3000 \\
\text{Typrft:} & 3000 \\
\text{TYCF:} & 17000 \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|}
\hline
\text{YR} & \text{CF} \\
0 & -100000 \\
1 & 42600 \\
2 & 42600 \\
3 & 59600 \\
\hline
\end{array}
\]

\[
\text{NPV@15\%:} \quad $8,443.17 \\
\text{IRR:} \quad 19.7\%
\]
NPV = -100,000 + 42,600/(1.15) + 42,600/(1.15^2) + 59,600/(1.15^3) = 8,443
Accept the project because the NPV is positive.

c) \( r_E = 5\% + 1.25(8\%) = 15\%; \ r_D = 5\% \)

Company Cost of capital = 5\% (5/25) + 15\% (20/25) = 1\% + 12\% = 13\%

**Question 2**

a) decrease current liabilities by utilizing more long-term debt, thereby increasing the current and quick ratios.

b) An increase in debt ratio will result in an increase in the return on equity.

c)
(i) \( \text{CR} = \frac{\text{CA}}{\text{CL}} = \frac{\text{RM}14,250}{\text{RM}15,675} = 0.91x \); poor.
(ii) \( \text{QR} = \frac{(\text{CA} - \text{Inv})}{\text{CL}} = \frac{(\text{RM}14,250 - \text{RM}4,350)}{\text{RM}15,675} = 0.63x \); poor.
(iii) \( \text{DSO} = \frac{\text{AR}}{(\text{Sales}/365)} = \frac{\text{RM}8,900}{(\text{RM}100,000/365)} = 32.5 \text{ days}; \) poor.
(iv) \( \text{Inv T/O} = \frac{\text{Sales}}{\text{Inv}} = \frac{\text{RM}100,000}{\text{RM}4,350} = 22.99x \); good.
(v) \( \text{Debt ratio} = \frac{\text{TD}}{\text{TA}} = \frac{\text{RM}19,800}{\text{RM}36,000} = 55\% \); poor.
(vi) \( \text{TIE} = \frac{\text{EBIT}}{\text{intexp}} = \frac{\text{RM}2,000}{\text{RM}500} = 4x \); poor.
(vii) Gross profit = \( \frac{\text{GP}}{\text{Sales}} = \frac{\text{RM}13,000}{\text{RM}100,000} = 13\% \); good.
(viii) Net profit = \( \frac{\text{NI}}{\text{Sales}} = \frac{\text{RM}900}{\text{RM}100,000} = 9\% \); good.
(ix) \( \text{ROA} = \frac{\text{NI}}{\text{TA}} = \frac{\text{RM}900}{\text{RM}36,000} = 2.5\% \); good.
(x) \( \text{ROE} = \frac{\text{NI}}{\text{OE}} = \frac{\text{RM}900}{\text{RM}16,200} = 5.6\% \); good.
PART B

Question 1

a)  
STEP I: Find the PV of the perpetuity.

\[
PV_{\text{of perpetuity}}@6\% = \frac{RM1,000,000}{0.06} = RM16,666,667
\]

STEP II: Find A of an ordinary annuity that makes the FV in Yr 10 to be RM16,666,667.

\[
RM16,666,667 = A \frac{(1+0.06)^{10} - 1}{0.06} = A \times 1.7908 - 1 \frac{0.06}{0.06} = 13.18A
\]

Therefore; \[A = \frac{RM16,666,667}{13.18} = RM1,264,542.26\]

b)  

<table>
<thead>
<tr>
<th>Year</th>
<th>Bonus</th>
<th>FVIF&lt;sub&gt;5%, t&lt;/sub&gt;</th>
<th>Bonus(t)</th>
<th>n</th>
<th>FVIF&lt;sub&gt;8%, n&lt;/sub&gt;</th>
<th>FV</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$1,500</td>
<td>1.000</td>
<td>$1,500</td>
<td>5</td>
<td>1.469</td>
<td>$2,203.50</td>
</tr>
<tr>
<td>1</td>
<td>1,500</td>
<td>1.050</td>
<td>1,575</td>
<td>4</td>
<td>1.360</td>
<td>2,142.00</td>
</tr>
<tr>
<td>2</td>
<td>1,500</td>
<td>1.102</td>
<td>1,653</td>
<td>3</td>
<td>1.260</td>
<td>2,082.78</td>
</tr>
<tr>
<td>3</td>
<td>1,500</td>
<td>1.158</td>
<td>1,737</td>
<td>2</td>
<td>1.166</td>
<td>2,025.34</td>
</tr>
<tr>
<td>4</td>
<td>1,500</td>
<td>1.216</td>
<td>1,824</td>
<td>1</td>
<td>1.080</td>
<td>1,969.92</td>
</tr>
<tr>
<td>5</td>
<td>1,500</td>
<td>1.276</td>
<td>1,914</td>
<td>0</td>
<td>1.000</td>
<td>1,914.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$12,337.54</td>
</tr>
</tbody>
</table>

c)  I: 7.76% vs. II: 7.56%; choose Account I.

d)  As time passes, the outstanding principal amount will increase due to the installment payments, resulting in lower interest amount charges by the bank.
Question 2

a)

<table>
<thead>
<tr>
<th>Asset</th>
<th>CV</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.50</td>
</tr>
<tr>
<td>II</td>
<td>0.63</td>
</tr>
<tr>
<td>III</td>
<td>0.64</td>
</tr>
<tr>
<td>IV</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Choose Asset I as it has the lowest CV.

b)

<table>
<thead>
<tr>
<th>E(R):</th>
<th>9.35</th>
</tr>
</thead>
<tbody>
<tr>
<td>StdDev:</td>
<td>2.76</td>
</tr>
<tr>
<td>CV:</td>
<td>0.30</td>
</tr>
</tbody>
</table>

c) Diversification reduces risk because prices of different securities do not move exactly together. When you form portfolios using a large number of stocks the variability of the portfolio is much less than average variability of individual stocks.

d) \( r = 4\% + (1.5)(12\% - 4\%) = 16\% \); the expected rate of return is less than the required rate of return (i.e. 15%). The stock is overpriced.
Question 3

a)

<table>
<thead>
<tr>
<th>t</th>
<th>Do</th>
<th>FVIF5%,t</th>
<th>Dt</th>
<th>PVIF8%,t</th>
<th>PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$2.50</td>
<td>1.030</td>
<td>$2.58</td>
<td>0.909</td>
<td>$2.35</td>
</tr>
<tr>
<td>2</td>
<td>2.50</td>
<td>1.061</td>
<td>2.65</td>
<td>0.826</td>
<td>2.19</td>
</tr>
<tr>
<td>3</td>
<td>2.50</td>
<td>1.093</td>
<td>2.73</td>
<td>0.751</td>
<td>2.05</td>
</tr>
<tr>
<td>4</td>
<td>2.50</td>
<td>1.126</td>
<td>2.82</td>
<td>0.683</td>
<td>1.93</td>
</tr>
<tr>
<td>5</td>
<td>2.50</td>
<td>1.159</td>
<td>2.90</td>
<td>0.621</td>
<td>1.80</td>
</tr>
</tbody>
</table>

\[
P_1 = \frac{\text{Value of stock}}{\text{Value of stock} + \text{Debt}} = \frac{10.32}{10.32 + 2.90} = \frac{10.32}{13.22} \\
D_0 = 2.90 \times (1 + 0.06) = 3.07
\]

\[
P_2 = \frac{3.07}{0.10 - 0.06} \times \frac{1}{(1 + 0.10)^5} = 47.66
\]

Value of stock = $47.66 + $10.32 = $57.98

b)

<table>
<thead>
<tr>
<th>YR</th>
<th>CF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>4.25</td>
</tr>
<tr>
<td>3</td>
<td>106</td>
</tr>
</tbody>
</table>

\[\text{PV@12\%: \$81.52}\]

c)

(i) Common stockholders have a voice in management; bondholders do not.

(ii) Common stockholders have a junior claim on assets and income relative to bondholders.

(iii) Bonds have a stated maturity but stock does not.

d) buy the asset, which will drive the price up and cause expected return to reach the level of the required return.
**Question 4**

a) The main advantage of IRR is that it is easy to communicate. 

There are several disadvantages to IRR method. It is difficult to intuitively explain the concept of internal rate of return. It is not useful in evaluating complex projects, mutually exclusive projects and dependent projects. For projects with high IRRs, reinvestment rate assumption implicit in the method may be unrealistic. It is also more complicated to calculate. You can also get multiple rates of return in case of projects where the cash flows have more than change in sign. One way to eliminate this problem is by using the modified internal rate of return method. Also, IRR cannot distinguish between borrowing and lending projects. In most cases it may be easier to use the NPV method.

b) The opportunity cost is RM250,000 since the company has to forego the market value of the building should it proceeds with the project.

c) Cash flow each year = (0.4)(250,000) = 100,000; Payback period = 2.5 years

d) After-tax CF= 1,500,000(1-0.2) = 1,200,000

\[ PV_{\text{inflows}} = \frac{1,200,000}{(1 + IRR)} + \frac{1,200,000}{(1 + IRR)^2} + \frac{1,200,000}{(1 + IRR)^3} \]

\[ PV_{\text{outflows}} = -2,400,000 \]

\[ IRR = 23.4\% \]
Question 5

a)

\[
1,004.60 = 0.0825 \times 1,000 \times \left( \frac{1 - \frac{1}{1 + r^{17.5}}}{r} \right) + \frac{1,000}{(1 + r)^{17.5}};
\]

This cannot be solved directly, so it's easiest to just use the calculator method to get an answer. You can then use the calculator answer as the rate in the formula just to verify that your answer is correct.

Enter: \[
\begin{array}{cccc}
17.5 & -1,004.60 & 82.50 & 1,000 \\
N & I/Y & PV & PMT & FV
\end{array}
\]

Solve for: \[8.1996\]
Answer is 8.20 percent.

b)

\[
P = \frac{0.07 \times 1,000}{2} \times \left( \frac{1 - \left(1 + \frac{0.1478}{2}\right)^{13.5 \times 2}}{1 + \frac{0.1478}{2}} \right) + \frac{1,000}{(1 + \frac{0.1478}{2})^{13.5 \times 2}}
\]

\[= 404.525 + 145.873\]
\[= 550.40\]

Enter: \[
\begin{array}{cccc}
13.5 \times 2 & 14.78/2 & 70/2 & 1,000 \\
N & I/Y & PV & PMT & FV
\end{array}
\]

Solve for: \[-550.40\]

c) Bintulu’s bond is more volatile as it has longer maturity period and lower coupon rate. Therefore, it will experience more price changes than Miri’s bond.

d)

Current yield = \[
\frac{0.06 \times 1,000}{1,047.20} = 0.0573 = 5.73\text{ percent}
\]