INV2601 2012 MAY/JUNE EXAM MEMORANDUM

Question	Option	Solution
1.	**2**	Diversification
2.	**2**	Minimum
3.	**3**	$E_C = (0.5 \times 2) + (0.3 \times 8) + (0.2 \times 14)$ $= 1.00 + 2.40 + 2.80$ $= 6.20\%$ $E_D = (0.5 \times 5) + (0.3 \times 10) + (0.2 \times 16)$ $= 2.50 + 3.00 + 3.20$ $= 8.70\%$ $\sigma_D = \sqrt{0.5(5 - 8.70)^2 + 0.3(10 - 8.70)^2 + 0.2(16 - 8.70)^2}$ $= \sqrt{6.8450 + 0.5070 + 10.6580}$ $= \sqrt{18.01}$ $= 4.24\%$
4.	**2**	the present value of the cash flows expected from an asset.
5.	**3**	Investment trusts
6.	**2**	Market orders

7.	**4**	$k = r_f + \beta(r_m - r_f)$ $= 7 + 0.8(12 - 7)$ $= 7 + 4$ $= 11\%$ $HPR = \left[\frac{Ending\ value}{Beginning\ value} - 1\right] \times 100$ $= \left[\frac{54}{50} - 1\right] \times 100$ $= 8\%$ The expected return (HPR) is 8% which is lower than the required rate of return (k) which is 11%. The share is overvalued hence you will have to sell the share.
8.	**2**	(i) beta (ii) standard deviation
9	**4**	$\beta = \frac{Corr_{i,m} \times \sigma_i \times \sigma_m}{\sigma^2{}_m}$ $= \frac{0.20 \times 0.12 \times 0.04}{0.04^2}$ $= \frac{0.0010}{0.0016}$ $= 0.63$

10.	**3**	$PV\ -500$ $FV\ 940$ $N\ 4$ $COMP\ I/YR\ 17.10\%$
11.	**2**	$PV\ 20\ 000$ $N\ 30 \quad (15 \times 2)$ $I/YR \quad 5\ (10 \div 2)$ $COMP\ FV\ R86\ 438.85$ OR $= 20\ 000(1.05)^{30}$ $= R86\ 438.85$
12.	**3**	$CF_0 = -100\ 000$ $CF_1 = 20\ 000$ $CF_2 = 40\ 000$ $CF_3 = 80\ 000$ $CF_4 = 100\ 000$ $COMP\ IRR = 34.70\%$

13.	**4**	$V_0 = \frac{D_1}{k-g}$ $= \frac{D_0(1+g)}{k-g}$ $= \frac{1.00(1.05)}{0.09-0.05}$ $= \frac{1.05}{0.04}$ $= R26.25$
14.	**3**	Calculate the expected cash flows: $D_0 = 2.00$ $D_1 = 2.00(1.10) = 2.20$ $D_2 = 2.20(1.10) = 2.42$ $D_3 = 2.42(1.05) = 2.5410$ $P_2 = \frac{D_3}{k-g}$ $= \frac{2.5410}{0.08-0.05}$ $= R84.70$ Calculate the intrinsic value: $V_0 = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \frac{P_2}{(1+k)^2}$

		$= \frac{2.20}{(1.08)^1} + \frac{2.42}{(1.08)^2} + \frac{84.70}{(1.08)^2}$ $= 2.0370 + 2.0748 + 72.6166$ $= R76.73$
15.	**2**	$NAV = \frac{Total\ assets - Total\ liabilities}{No\ of\ issued\ shares}$ $= \frac{4\ 500\ 000 - 680\ 000}{200\ 000}$ $= R19.10$
16.	**4**	Planned consumption, investment, government expenditure and net exports.
17.	**3**	Price pressure from complementary products.
18.	**1**	$Cash\ ratio = \frac{current\ assets - inventory - receivables}{current\ liabilities}$ $= \frac{1070 - 625 - 245}{745}$ $= \frac{200}{745}$ $= 26.85\%$ $Net\ profit\ margin = \frac{Net\ profit}{Sales}$

		$= \frac{98}{2400}$ $= 4.08\%$
19.	**1**	Cyclical
20.	**4**	$g = ROE \times RR$ $= 25\% \times 0.40$ $= 10\%$ $P_0/_{E_1} = \frac{D/_E}{k - g}$ $= \frac{0.60}{0.12 - 0.10}$ $= 30 \times$
21.	**1**	Support
22.	**3**	premium
23.	**2**	Interest risk
24.	**1**	$FV \quad 1000$ $PV \; -1388.49$ $N \quad 15$ $PMT \; 100$ $COMP \; I/YR \; 6.00\%$

25.	**1**	$Current\ yield = \frac{coupon\ payment}{bond\ price}$ $= \frac{0.10 \times 1000}{1388.49}$ $= 7.20\%$
26.	**2**	A bond with a 15-year maturity and a coupon rate of 7%.
27.	**1**	$Future\ value\ of\ reinvested\ coupons$ $= 70(1.07)(1.06) + 70(1.06) + 70$ $= 79.3940 + 74.20 + 70$ $= R223.5940$ $Total\ future\ value = 1000 + 223.5940$ $= 1223.5940$ $FV \quad 1\ 223.5940$ $PV \quad -950$ $N \quad 3$ $COMP\ I/YR\ 8.80\%$

28.	**2**	**12 *month spot rate*** $\frac{4.50}{1.03} + \frac{104.50}{(1+x)^2} = 101.90$ $4.3689 + \frac{104.50}{(1+x)^2} = 101.90$ $\frac{104.50}{(1+x)^2} = 101.90 - 4.3689$ $\frac{104.50}{(1+x)^2} = 97.5311$ $(1+x)^2 = \frac{104.50}{97.5311}$ $(1+x)^2 = 1.0715$ $1+x = 1.0715^{0.5}$ $1+x = 1.0351$ $x = (1.0351 - 1) \times 2 \times 100$ $= 7.02\%$
29.	**2**	It is a private and customized transaction.
30.	**3**	The option can be exercised only on its expiration date.
31.	**2**	$X = 50 - 2$ $= R48$
32.	**2**	$Maximum\ loss\ to\ put\ writer = X - p$ $= break\ even$ $= 50 - 4$

		$= R46$ $Maximum\ gain\ to\ the\ call\ writer = call\ premium$ $= R2$
33.	**3**	$delta = \frac{f^+ - f^-}{S^+ - S^-}$ $= \frac{13 - 3}{105 - 95}$ $= 1.0$ $f^+ = S^+ - X$ $= 105 - 92$ $= 13$ $f^- = S^- - X; MAX\ 0$ $= 95 - 92 = 3$ $S^+ = 100 + 5 = 105$ $S^- = 100 - 5 = 95$

34.	**2**	$Put - Call\ parity$: $c + \frac{X}{(1+r)^{T-t}} = S + p$ $c + \frac{100}{(1.08)^{0.75}} = 92 + 5$ $c + \frac{100}{1.0594} = 97$ $c + 94.3931 = 97$ $c = 97 - 94.3931$ $= R2.61$
35.	**4**	Vega
36.	**2**	Covered call
37.	**1**	Accumulation phase
38.	**1**	$Covariance = r_{P,Q} \times \sigma_P \times \sigma_Q$ $= 0.85 \times 0.56 \times 0.92$ $= 0.44$
39.	**1**	$\propto = r_p - [r_f + \beta(r_m - r_f)$ $\propto_G = 15 - [7 + 0.8(14 - 7)$ $= 15 - 12.60$ $= 2.40\%$

		$\propto_H = 16 - [7 + 1.1(14 - 7)$ $= 16 - 14.70$ $= 1.30\%$ $\propto_L = 18 - [7 + 1.4(14 - 7)$ $= 18 - 16.80$ $= 1.20\%$ Fund G has the highest Jensen measure.
40.	**2**	$Sharpe\ measure = \frac{r_H - r_f}{\sigma_H}$ $= \frac{16 - 7}{10}$ $= 0.90$ $Treynor\ measure = \frac{r_H - r_f}{\beta_H}$ $= \frac{16 - 7}{1.1}$ $= 8.18$