ACCA INTERIM ASSESSMENT

Advanced Financial Management

2012

Paper P4

Time allowed

Reading time: **15 minutes**

Writing time: **3 hours**

Answer BOTH questions in section A and TWO questions in Section B

Do not open this paper until instructed by the supervisor

This question paper must not be removed from the examination hall

Kaplan Publishing/Kaplan Financial

KAPLAN PUBLISHING

SECTION A

ANSWER BOTH QUESTIONS

QUESTION 1

Fuelit plc is an electricity supplier in the UK. The company has historically generated the majority of its electricity using a coal-fuelled power station but, as a result of the closure of many coal mines and depleted coal resources, is now considering what type of new power station to invest in. The alternatives are a gas-fuelled power station or a new type of efficient nuclear power station.

Both types of power station are expected to generate annual revenues at current prices of £800 million. The expected operating life of both types of power station is 25 years.

Financial estimates:

	£ million	
	Gas	*Nuclear*
Building costs	600	3,300
Annual running costs (at current prices):		
Labour costs	75	20
Gas purchases	500	–
Nuclear fuel purchases	–	10
Sales and marketing expenses	40	40
Customer relations	5	20
Interest expense	51	330
Other cash outlays	5	25
Accounting depreciation	24	132

Other information:

(i) Whichever power station is selected, electricity generation is scheduled to commence in three years' time.

(ii) If gas is used most of the workers at the existing coal-fired station can be transferred to the new power station. After tax, redundancy costs are expected to total £4 million in year four. If nuclear power is selected fewer workers will be required and, after tax, redundancy costs will total £36 million, also in year four.

(iii) Both projects would be financed by Eurobond issues denominated in Euros. The gas-powered station would require a bond issue at 8.5% per year, while the bond for the nuclear project would be at 10% reflecting the impact on financial gearing of a larger bond issue.

(iv) Costs of building the new power stations would be payable in two equal instalments in one and two years' time.

(v) The existing coal-fired power station would need to be demolished at a cost of £10 million in three years' time.

(vi) The company's equity beta is expected to be 0.7 if the gas station is chosen and 1.4 if the nuclear station is chosen. Gearing (debt to equity plus debt) is expected to be 35% with gas and 60% with nuclear fuel.

(vii) The risk free rate is 4.5% per year and the market return is 14% per year. Inflation is currently 3% per year in the UK and an average of 5% per year in the member countries of the euro zone in the European Union.

(viii) Corporate tax is at the rate of 30%, payable in the same year that the liability arises.

(ix) Tax allowable depreciation is at the rate of 10% per year on a straight line basis.

(x) At the end of 25 years of operations the gas plant is expected to cost £25 million (after tax) to demolish and clean up the site. Costs of decommissioning the nuclear plant are much less certain, and could be anything between £500 million and £1,000 million (after tax) depending upon what form of disposal is available for nuclear waste.

Required:

(a) Estimate the expected NPV for each of the investment in a gas-fuelled power station and the investment in a nuclear-fuelled power station.

State clearly any assumptions that you make.

Note: **It is recommended that annuity tables are used wherever possible.**

(18 marks)

(b) Discuss other information that might assist the decision process. (3 marks)

(c) An external advisor has suggested that the discount rate for the costs of decommissioning the nuclear power station should be adjusted because of their risk. Discuss whether or not this discount rate should be increased or decreased.

(3 marks)

(d) Explain the significance of the existence of real options to the capital investment decision, and briefly discuss examples of real options that might be significant in the power station decision process. (6 marks)

(Total: 30 marks)

QUESTION 2

Rosy plc is a UK based, internationally diversified company, operating in the food manufacturing industry. It is currently considering a new capital project in Australia, known as Project XY.

New project details

Project XY would require immediate capital expenditure of A$ 15m, plus A$ 5m of working capital which would be recovered at the end of the project's four year life. It is estimated that an annual revenue of A$ 18m would be generated, with annual operating costs of A$ 5m. Straight-line depreciation over the life of the project is an allowable expense against company tax in Australia which is charged at a rate of 50%, payable at each year-end without delay. The project's capital assets can be assumed to have a zero scrap value.

Financing proposal

Rosy plans to finance Project XY with a £5m four-year loan (net of issue costs) from the Euro-sterling market, plus £5m of retained earnings. Issue costs on the Euro-sterling debt will be 2.5% and are tax deductible. The credit spread applicable to Rosy plc on the Euro-sterling loan is 40 basis points above the current UK risk free rate.

However, there has been some disagreement about the proposed method of finance. The Chairman has suggested a rights issue of shares, while the sales director would like the Board to consider the use of an Australian dollar loan.

Other information

The food manufacturing industry has an equity beta of 1.40 and an average debt: equity gearing ratio of 1:4. Debt capital can be assumed to be virtually risk-free. The current return on UK government stock is 5.6% and the equity risk premium is 12%.

Corporate tax in the UK is at 35% and can be assumed to be payable at each year-end without delay. Because of a double-taxation agreement, Rosy will not have to pay any UK tax on Project XY. The company is expected to have a substantial UK tax liability from other operations for the foreseeable future.

The current spot rate is A$ 2.0000 to £1 and the A$ is expected to depreciate against the £ at an annual rate of 10%.

Required:

(a) Estimate the adjusted present value (APV) of Project XY. Recommend whether the project should be undertaken. (14 marks)

(b) Explain the difference between APV and NPV as methods of investment appraisal. Comment upon the circumstances under which APV might be a better method of evaluating a capital investment than NPV. (6 marks)

(c) Discuss the advantages and disadvantages of the company's intended financing plans for Project XY. Briefly evaluate the suggested alternative ways of raising the required finance. (10 marks)

(Total: 30 marks)

SECTION B

ANSWER TWO QUESTIONS ONLY

QUESTION 3

Sadlier plc has short term investments in the shares of four listed companies:

Company	*Holding*
A plc	100,000 shares, 50 pence par value
B plc	155,000 shares, £1 par value
C plc	260,000 shares, 20 pence par value
D plc	430,000 shares, 10 pence par value

Company	*Equity beta*	*Market price (pence)*	*Latest dividend yield (%)*	*Expected total return on investment a year (%)*
A plc	1.55	280	6.8	21.0
B plc	0.65	340	3.6	12.5
C plc	1.26	150	6.4	18.0
D plc	1.14	95	7.2	18.5

The yield on Treasury Bills is 6% a year, and the market return is 16% a year.

Required:

(a) Estimate the risk of Sadlier's short term investment portfolio relative to the market.

(6 marks)

(b) Recommend, giving reasons, whether the composition of Sadlier's short-term investment portfolio should be changed. Relevant calculations must be shown.

(14 marks)

(Total: 20 marks)

QUESTION 4

The following data relates to a large company operating in the electronics industry.

	20X3	*20X4*	*20X5*	*20X6*	*20X7*
After tax earnings (£ million)	130	195	255	295	472
Dividend per share (pence)	9.75	11.0	12.75	14.0	15.5
Number of ordinary shares (million)	508	600	650	695	930
Average share price (pence)	740	875	690	820	1,012
Net capital investment (£ million)	210	270	340	410	520
Annual increase in inflation (%)	4	4	3	3	3

A major institutional shareholder has criticised the level of dividend payment of the company suggesting that it should be substantially increased.

Required:

(a) Briefly discuss the factors that are likely to influence the company's dividend policy.

(6 marks)

(b) Discuss whether or not the institutional shareholder's criticism is likely to be valid.

(6 marks)

(c) Hiome plc has experienced a period of above average growth for its industry, but is now growing at a normal rate of about 10% per annum. The company's directors are reviewing the current dividend policy. One director has suggested that, as the company no longer needs as much internally generated funds to finance new investment, a higher proportion of earnings should be paid out as dividends in order to benefit the company's shareholders. Another director has read that two eminent economists, Miller and Modigliani, have stated that the pattern of dividend payouts is irrelevant, and therefore shareholders will experience no gain from a higher level of dividends.

Discuss whether or not an increase in dividends is likely to benefit the shareholders of Hiome plc. (8 marks)

(Total: 20 marks)

QUESTION 5

(a) The finance team of Fleet plc is undertaking a financial review of a potential new project. The new project is in the same industry as Fleet plc and the capital structure of the enlarged company will remain unchanged. The following details are available:

The capital structure of Fleet plc as at 1st January 2008 is as follows:

	£m
Issued ordinary shares (25p shares)	250
Bank term loan	300
8% irredeemable debenture	600

The ordinary shares have a current market price of £2 each. Dividends per share in the five preceding years were as follows:

2003	6.9 pence
2004	7.2 pence
2005	8.8 pence
2006	9.6 pence
2007	10.5 pence

The dividend for 2007 has just been paid.

The bank is currently charging 10% on the term loan.

The debenture stock has a market price of £75.

The company pays corporation tax at a rate of 30%.

Required:

Calculate a suitable discount rate for the new project. (8 marks)

(b) Fleet plc has a subsidiary company Foxes plc. It currently invests in two projects, one of which is in the leisure industry and the other in publishing. These represent 65% and 35% respectively of Foxes plc's total market value.

The firm is considering investing additional funds into one of these projects, so the Financial Manager has presented the following analysis as a starting point to an investment appraisal:

	Leisure industry	*Publishing industry*	*Foxes plc*
Average beta equity	1.10	????	1.20
Average gearing of firms in the industry (D:E)	30:70	40:60	20:80

Unfortunately, the Financial Manager's spreadsheet has been corrupted so that the Publishing Industry beta equity is illegible. He is now uncontactable on holiday, so the firm's Chief Executive has asked for your help in reconstructing the spreadsheet.

N.B. Corporate taxation is at the rate of 30%. Assume that debt is risk free, so the beta of debt is zero.

Required:

From the information presented, reconstruct the Financial Manager's spreadsheet by calculating the average beta equity of the Publishing Industry. (8 marks)

(c) The directors of Foxes plc have decided to go ahead with a further investment in the leisure industry. They have presented you with the following further information:

- The financial gearing of the company is not expected to change as a result of any expansion.
- The IRR of Foxes plc's after tax cash flows on redeemable debt is 6.0%. The risk free rate is 5% and the estimated market return is 10%.

Required:

Calculate a suitable discount rate in order to appraise the additional investment in the leisure industry. (4 marks)

(Total: 20 marks)

MATHEMATICAL TABLES

FORMULAE AND TABLES

Modigliani and Miller Proposition 2 (with tax)

$$k_e = k^i_e + (1 - T)(k^i_e - k_d)\ \frac{V_d}{V_e}$$

Two asset portfolio

$$s_p = \sqrt{w_a^2 s_a^2 + w_b^2 s_b^2 + 2 w_a w_b r_{ab} s_a s_b}$$

The Capital Asset Pricing Model

$$E(r_i) = R_f + \beta_i(E(r_m) - R_f)$$

The asset beta formula

$$\beta_a = \left(\frac{V_e}{(V_e + V_d(1 - T))}\beta_e\right) + \left(\frac{V_d(1 - T)}{V_e + V_d(1 - T))}\beta_d\right)$$

The Growth Model

$$P_o = \frac{D_o(1 + g)}{(r_e - g)}$$

Gordon's growth approximation

$$g = br_e$$

The weighted average cost of capital

$$WACC = \left(\frac{V_e}{V_e + V_d}\right)k_e + \left(\frac{V_d}{V_e + V_d}\right)k_d(1 - T)$$

The Fisher formula

$$(1+i) = (1+r)(1+h)$$

Purchasing power parity and interest rate parity

$$s_1 = s_o \times \frac{(1 + h_c)}{(1 + h_b)} \quad f_0 = s_o \times \frac{(1 + i_c)}{(1 + i_b)}$$

Modified internal rate of return

$$MIRR = \left[\frac{PV_R}{PV_I}\right]^{\frac{1}{n}}(1+r_e)-1$$

The Black-Scholes option pricing model

$$c = P_aN(d_1) - P_eN(d_2)e^{-rt}$$

Where:

$$d_1 = \frac{\ln(P_a / P_e) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_2 = d_1 - s\sqrt{t}$$

The Put Call Parity relationship

$$p = c - P_a + P_e e^{-rt}$$

PRESENT VALUE TABLE

Present value of 1, i.e. $(1 + r)^{-n}$

Where r = discount rate

n = number of periods until payment

Periods (n)	Discount rate (r)									
	1%	**2%**	**3%**	**4%**	**5%**	**6%**	**7%**	**8%**	**9%**	**10%**
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239

Periods (n)	Discount rate (r)									
	11%	**12%**	**13%**	**14%**	**15%**	**16%**	**17%**	**18%**	**19%**	**20%**
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.074	0.065

ANNUITY TABLE

Present value of an annuity of 1, i.e. $\frac{1-(1+r)^{-n}}{r}$

Where r = discount rate
n = number of periods

Periods (n)	Discount rate (r)									
	1%	**2%**	**3%**	**4%**	**5%**	**6%**	**7%**	**8%**	**9%**	**10%**
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	8.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606

Periods (n)	Discount rate (r)									
	11%	**12%**	**13%**	**14%**	**15%**	**16%**	**17%**	**18%**	**19%**	**20%**
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.968	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675

STANDARD NORMAL DISTRIBUTION TABLE

	.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2703	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4430	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4980	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

This table can be used to calculate $N(d_i)$, the cumulative normal distribution functions needed for the Black-Scholes model of option pricing. If $d_1 > 0$, add 0.5 to the relevant number above. If $d_1 < 0$, subtract the relevant number above from 0.5.