

ACCA MOCK B

Advanced Financial Management

December 2017

Time allowed 3 hours and 15 minutes

This question paper is divided into two sections

Section A This ONE question is compulsory and MUST be attempted

Section B TWO questions ONLY to be attempted

Formulae and Tables are on pages 9-13

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SECTION A

This ONE question is compulsory and MUST be attempted

- 1 Plaistow Co provides industrial and commercial cleaning services to organisations throughout a country in the European Union. Its shares have been listed for 15 years and, until two years ago, the entity followed a policy of aggressive growth, mainly by acquisition.

However, in the last two years, there have been few suitable take-over opportunities and, as a consequence, growth has slowed. The market has downgraded Plaistow's shares and they are currently trading at €3.57, the lowest price for five years. The market as a whole has declined in value, but not to the same extent as Plaistow's shares.

Plaistow's bank has recently informed Plaistow's directors of a possible take-over opportunity of another of its clients, Billericay.

This is a large private entity in the same industry as Plaistow. Billericay's directors have indicated to the bank that, if the price is right they may be prepared to recommend the sale to the shareholders. Billericay's directors have made their financial forecasts and other strategic documentation available to the bank on a strictly confidential basis, requesting that this information only be released to a serious potential bidder. After much discussion between the bank and the two companies, Billericay agrees that Plaistow should have the information.

Billericay's results for the past three years and the directors' estimates for the current year are as follows:

<i>Year to 30 June</i>	<i>Revenue</i>	<i>Earnings</i>	<i>Free Cash Flow to Equity (before Capital Investment)</i>	<i>Capital Expenditure</i>
	<i>€ (million)</i>	<i>€ (million)</i>	<i>€ (million)</i>	<i>€ (million)</i>
20X3	925	55.5	52.6	17.1
20X4	1,020	62.7	60.1	18.5
20X5	1,150	71.5	72.1	22.4
20X6 (forecast)	1,350	88.9	84.4	29.6

For 20X7 onwards, growth in earnings and dividends is likely to fall to 4% per annum, according to Billericay's directors.

Summary statements of financial position as at 30 June 20X5 for both Plaistow and Billericay are as follows:

	<i>Plaistow</i> € (million)	<i>Billericay</i> € (million)
Total assets		
Non-current assets	1,944	1,040
Current assets *	796	375
	<hr/> 2,740	<hr/> 1,415
	<hr/>	<hr/>
* Includes cash of	250	65
	<hr/>	<hr/>
Equity and liabilities		
Share capital (shares of €1)	420	
(shares of 50 cents)		220
Retained earnings	1,080	680
	<hr/> 1,500	<hr/> 900
Non-current liabilities		
(Secured bonds, 4% 20Y5)	750	
(Unsecured bonds, 5% 20Y0)		300
Current liabilities	490	215
	<hr/> 2,740	<hr/> 1,415
	<hr/>	<hr/>

Plaistow's revenues and earnings for the year ended 30 June 20X5 were €2,250 million and €128.5 million respectively.

After thoroughly examining the information on Billericay, financial managers in Plaistow have identified a number of savings and potential synergies that would arise if the take-over were to go ahead. These synergies are estimated to have a net present value of €200 million. However, the Plaistow directors believe Billericay's forecast earnings are over-optimistic and think earnings growth for 20X7 onwards is likely to be much lower than the 4% estimated by Billericay's directors. The bank advisers disagree, but they are in a delicate situation trying to balance the interests of two clients.

Plaistow's cost of equity is 8.5%. Billericay has not provided information on its cost of capital, but the two entities' asset betas are likely to be the same. Plaistow's equity beta is quoted as 1.1. The expected risk-free rate of return, based on the returns from government stock, is 3% and the expected equity risk premium is 5%. Assume that the debt beta for both companies is 0.2 and that Plaistow's debt is trading at par. The corporation tax rate is 30%.

Required:

- (a) Estimate the cost of equity capital and the weighted average cost of capital for Billericay, using the book values of equity and debt as the weightings. Explain the circumstances where each of these two rates would be used in the business valuation process. (9 marks)
- (b) Estimate the likely long run growth rate of Billericay, using the current rate of retention of free cash flow to equity, and your estimate (from part (a)) of the required rate of return on equity. State any assumptions that you make. (5 marks)
- (c) Prepare a report to the directors of Plaistow Co, advising them on:

- (i) a bidding strategy; that is the initial price to be offered and the maximum Plaistow should be prepared to offer for the shares in Billericay.

In this part of your report, you should present calculations of the value of the equity in Billericay (both with and without incorporating the likely synergy) using the net assets method, the P/E method, and the discounted value of free cash flow to equity. For each method, give brief comments on their suitability in the circumstances here. (15 marks)

- (ii) the most appropriate form of consideration to use in the circumstances. Assume the choice is either a share exchange or cash (6 marks)

Your report should consider the interests of both groups of shareholders

Professional marks for format, structure and presentation of the report for part (c)
(4 marks)

- (d) During the past three years, one of Plaistow Co's competitors, SGV Co, has been adversely affected by a series of unforeseen incidents. These incidents resulted in major losses being incurred and brought the company to the brink of collapse.

Although the threat of company failure now appears to have receded, the shareholders, who have seen their investment in SGV Co decrease dramatically, recently replaced the board of directors. The new board is determined to ensure that the company avoids any such problem in the future and believes that this can be done by adopting a more systematic approach to risk management. It has decided to appoint a chief risk officer, who will become a senior member of the management team and who will be charged with implementing risk management processes throughout the business.

Required:

- (i) Identify and discuss the key factors that the chief risk officer should take into account to ensure the successful implementation of risk management processes within the company. (7 marks)
- (ii) Explain how the implementation of risk management processes may help to increase shareholder value (4 marks)

(Total: 50 marks)

SECTION B

TWO questions ONLY to be attempted

- 2 The directors of Mac Co have identified that the firm has a surplus of cash. In these recessionary times, they have decided to follow a cautious investment strategy, and are considering investing the cash surplus in corporate bonds.

The directors have identified two potential investments.

<i>Company</i>	<i>Term of bond</i>	<i>Par value</i>	<i>Coupon</i>	<i>Redemption</i>
Echo Co	4 years	\$100	5%	At par
Bunnymen Co	4 years	\$100	2%	At a 10% premium

The Echo Co bonds are currently trading at \$105.10 on the market, whereas the Bunnymen Co bonds are just about to be issued.

Both Echo Co and Bunnymen Co have an A credit rating according to the main credit rating agencies.

Required:

- (a) Calculate the gross redemption yield (yield to maturity) for the Echo Co bonds, and (on the assumption that the Bunnymen Co bonds will have the same yield) the theoretical value of the Bunnymen Co bonds. (4 marks)
- (b) Estimate the Macaulay duration of the two bonds Mac Co is considering for investment. (5 marks)
- (c) Advise the directors what factors should be considered by Mac Co when evaluating which bonds to invest in. Support the advice by referring to your calculations in parts (a) and (b) above. (8 marks)
- (d) Among the criteria used by credit agencies for establishing a company's credit rating are the following: industry risk, earnings protection, financial flexibility and evaluation of the company's management.

Briefly explain each criterion and suggest factors that could be used to assess it.

(8 marks)

(Total: 25 marks)

- 3 The monthly cash budget of Perigueux Co, a listed company based in the UK, shows that the company is likely to need to borrow £18 million in two months' time for a period of four months.

Financial markets have recently been volatile. The finance director of Perigueux Co fears that short term interest rates could rise by as much as 150 basis points. If few problems occur then short term rates could fall by 50 basis points. LIBOR is currently 6.50% and Perigueux Co can borrow at LIBOR + 0.75%.

The finance director does not wish to pay more than 7.50% for the borrowing, including option premium costs, but excluding the effect of margin requirements and commissions.

Information from the London International Financial Futures and Options Exchange (LIFFE):

LIFFE £500,000 3 month futures prices. Tick size is 0.01% and tick value is £12.50

December	93.40
March	93.10
June	92.75

LIFFE £500,000 3 months options prices (premiums in annual %). Tick size is 0.01% and tick value is £12.50

<i>Calls</i>			<i>Exercise price</i>	<i>Puts</i>		
<i>December</i>	<i>March</i>	<i>June</i>		<i>December</i>	<i>March</i>	<i>June</i>
0.33	0.88	1.04	92.50	–	–	0.08
0.16	0.52	0.76	93.00	–	0.20	0.34
0.10	0.24	0.42	93.50	0.18	0.60	1.33
–	0.05	0.18	94.00	0.36	1.35	1.92

Assume that it is now 1 December and that exchange traded futures and options contracts expire at the end of the month. Margin requirements and default risk may be ignored.

Required:

- (a) Estimate the financial results of undertaking EACH OF an interest rate futures hedge and an interest rate options hedge on the LIFFE exchange, if LIBOR

- (i) increases by 150 basis points AND
- (ii) decreases by 50 basis points.

Discuss your results and advise how successful the hedges would have been.

State clearly any assumptions that you make. (16 marks)

- (b) Discuss the relative advantages of using exchange traded interest rate options and over-the-counter (OTC) interest rate options. (4 marks)

- (c) The finance director has received some quotations for over-the-counter (OTC) interest rate options and wonders whether or not they are too expensive.

List the main determinants of interest rate option prices, and comment upon whether or not the OTC options are likely to be expensive. (5 marks)

(Total: 25 marks)

- 4 The US Government's research laboratories have developed a new technique for manufacturing a weapons-grade titanium alloy. Lakeman has been offered a licence to develop and market the alloy for permitted non-military uses on condition that it commences manufacture within the next twelve months.

Preliminary calculations, presented by the Marketing Director at the last board meeting, showed that the project would have a (negative) net present value (NPV) of $-\$10$ million if undertaken immediately.

The cash flows were discounted at a suitable cost of capital of 10% and comprised an investment of $\$190$ million followed by net cash inflows with a present value of $\$180$ million.

She thus argued that the proposal should be rejected.

However, the Finance Director argued that the weakness of conventional NPV analysis is that it ignores the value of embedded real options and therefore undervalues projects with high uncertainty. He suggested that the possibility of delaying the project for up to twelve months effectively gives Lakeman a call option on development and that if market forecasts improve over the next year, then the company can benefit. To get the 'right answer', he concluded, option values must be incorporated.

The current long-term government bond yield is 5%. The expected volatility (standard deviation) of the future cash flows is estimated to be 35%.

Required:

- (a) **Comment on the views of the Marketing and Finance Directors. (6 marks)**
- (b) **Using the Black-Scholes option pricing model for a European call option, estimate the value of the option to delay the development and marketing of the titanium alloy. Provide a recommendation as to whether or not Lakeman should develop the alloy. (10 marks)**
- (c) **Comment on the advisability of modelling the possibility of delay as a European call option. (4 marks)**
- (d) Lakeman has estimated an annual standard deviation of $\$1$ million on one of its other projects, based on a normal distribution of returns. The average annual return on this project is $\$5$ million.

Required:

Estimate the project's Value at Risk (VAR) at a 95% confidence level for one year and over the project's life of six years. Explain what is meant by the answers obtained. (5 marks)

(Total: 25 marks)

FORMULAE SHEET

Modigliani and Miller proposition 2 (with tax)

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

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

$$S_1 = S_0 \times \frac{(1+h_c)}{(1+h_b)} \qquad F_0 = S_0 \times \frac{(1+i_c)}{(1+i_b)}$$

Modified Internal Rate of Return

$$\text{MIRR} = \left[\frac{\text{PV}_R}{\text{PV}_1} \right]^{\frac{1}{n}} (1 + r_e) - 1$$

The Black-Scholes option pricing model

$$c = P_a N(d_1) - P_e N(d_2) e^{-rt}$$

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

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

MATHEMATICAL TABLES

Standard normal distribution table

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.0000	.0040	.0080	.0120	.0159	.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	.2518	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.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	.4485	.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	.4762	.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	.4865	.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	.4983	.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 $N(d)$, the cumulative normal distribution function needed for the Black-Scholes model of option pricing. If $d_i > 0$, add 0.5 to the relevant number above. If $d_i < 0$, subtract the relevant number above from 0.5.

Present value table

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

where r = discount rate

n = number of periods until payment

Periods (n)	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)	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	0.206	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	0.933
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 = interest rate

n = number of periods

Periods (n)	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	8.893	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606

Periods (n)	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	3.496	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	4.586	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	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

