UNIVERSITY OF BOLTON

GREATER MANCHESTER BUSINESS SCHOOL

MSC ACCOUNTANCY AND FINANCIAL MANAGEMENT

SEMESTER ONE EXAMINATIONS 2023/24

ADVANCED FINANCIAL MANAGEMENT

MODULE NO: ACC7504

Date: Monday 8th January 2024 **Time: 2.00pm – 5.00pm**

INSTRUCTIONS TO CANDIDATES:

There are THREE questions on this paper.

Answer ALL questions from sections A and B

This is a closed book examination

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SECTION A – PLEASE ANSWER ALL QUESTIONS

Question 1
The following exhibits provide information relevant to the question.

1. **Chailland Co**
2. **Forecast cash flows**
3. **Financing and hedging**

This information should be used to answer the question requirements within your chosen response option(s).

Exhibit 1: Chailland Co
Chailland Co is a large, stock market listed company based in the Eurozone. It has been a successful manufacturer of microphones for many years, and it sells its products throughout Europe and Asia. It sells relatively few microphones in the rest of the world.
The company's directors are now considering whether to establish a subsidiary in Rabbitia, to enable the company to penetrate the Rabbitia market, which is the largest market place for microphones in the world. Chailland Co's home currency is the euro (€), and the currency in Rabbitia is the Rabbitian dollar ($).

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Question 1 continued
Exhibit 2: Forecast cash flows

The subsidiary would cost a total of $20 million, including $4 million for working capital. A suitable existing factory and machinery have been located and production could commence quickly. A payment of $19 million would be required at the start of the project in 3 months' time on 1 June 20X5, with the remainder required 1 year later. The level of working capital is expected to stay constant and then be released at the end of the project.

Production and sales are forecast at 50,000 units in the first year and 100,000 units per year thereafter. The unit sales price, unit variable cost and total fixed costs in the first year are expected to be $100, $40 and $1 million respectively. After the first year, prices and costs are expected to rise at 5% per year, the forecast Rabbitia inflation rate over the next five years.

In addition, a fixed royalty of €5 per unit will be payable to the parent company, with payment to be made at the end of each year.

Chailland Co has a four-year planning horizon and estimates that the pre-tax realisable value of the non-current assets at the end of the four-year project on 31 May 20X9 will be $20 million.

It is the company's policy to remit the maximum funds possible to the parent company at the end of each year. Assume that there are no legal complications to prevent this.

Chailland Co currently exports some of its products to Rabbitia, yielding an annual after-tax net cash flow of €100,000. No production will be exported to Rabbitia if the subsidiary is established, but it is expected that new export markets of a similar worth in Africa could replace exports to Rabbitia. European production is at full capacity and there are no plans for further expansion in capacity.

Tax on the company's profits is at a rate of 50% in both countries, payable one year in arrears.

A double taxation treaty exists between Europe and Rabbitia, and no double taxation is expected to arise. No withholding tax is levied on royalties payable from Rabbitia to Europe.

Any losses are carried forward and netted off future profits for tax purposes.
Tax allowable depreciation is at a straight-line rate of 25% on the original $16 million cost of non-current assets. A balancing allowance or charge then arises on disposal.

Chailland Co believes that the appropriate discount rate for this investment is 13%. The current spot exchange rate is $1.300/€1, and the euro is expected to fall in value by approximately 5% per year relative to the Rabbitian dollar.

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Question 1 continued

Exhibit 3: Financing and hedging

Chailland Co is currently experiencing a shortage of cash, but the directors are keen to undertake the expansion project anyway. The shortage is only expected to last for a few months, so to fund the project, the directors have arranged to borrow $20 million on 1 June 20X5 for a 6-month period. The bank has offered a rate of 55 basis points above base rate, which is currently 3%.

The directors are concerned that interest rates might rise over the next few months, so they are considering the use of futures contracts or traded options to manage the company's exposure to interest rate risk.

Futures and options market data on 1 March 20X5 (today) for $1m, 3-month contracts

Futures prices	
March	96.92
June	96.52
September	96.20

Options data – premia are quoted in %

	CALLS			**PUTS**		
	March	**June**	**September**	**March**	**June**	
September						
96.50	0.66	1.02	1.30	0.10	0.19	0.25
97.00	0.34	0.56	0.87	0.25	0.53	0.76
97.50	0.06	0.22	0.35	0.44	1.05	1.23

Required:

(a) Evaluate the ethical issues that might need to be considered as part of a multinational company's investment decision process.

(10 marks)

(b) Prepare a report for the Board of Directors of Chailland Co in which you:

(i) Calculate the net present value of the proposed investment from the viewpoint of Chailland Co as at 1 June 20X5.

(17 marks)

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Question 1 continued

(ii) Explain what further issues should be considered before making a final decision on whether the project should be accepted.

(6 marks)

(iii) Based on the two hedging choices Chailland Co is considering and assuming that the company does not face any basis risk, recommend a hedging strategy for the $20 million loan. Support your recommendation with appropriate comments and relevant calculations in $. Ignore any exposure to exchange rate risk. Ignore margin requirements and assume that basis diminishes to zero at contract maturity at a constant rate.

(7 marks)

Professional marks will be awarded for the demonstration of skill in communication, analysis and evaluation, scepticism and commercial acumen in your answer.

(10 marks)

(Total: 50 marks)

End of Question 1

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SECTION B – ANSWER ALL QUESTIONS

Question 2

The following exhibits provide information relevant to the question.

1 **Mamtor Co**

2 **Relevant information for the FCF valuation**

3 **CIV valuation**

This information should be used to answer the question requirements within your chosen response option(s).

Exhibit 1: Mamtor Co
Mamtor Co is a listed company, which provides a comprehensive range of equipment and services to the oil industry. Its Head Office is in a country in the Eurozone, with subsidiaries based all around the world.

One of Mamtor's wholly owned subsidiaries, known as Mamtor Logistics and Procurement (L&P) offers maintenance and support services for the equipment which is supplied by other Mamtor subsidiaries. L&P is based in a country in the Eurozone. However, its revenues are always invoiced in US dollars (US$). Some suppliers to L&P submit invoices in US$ but others invoice L&P in euros (€).
The main board of Mamtor has been considering divestment of L&P for some time and has recently received an informal approach from Stanage Co, one of L&P's main competitors. The directors of Mamtor are now interested in ascertaining an appropriate price for the sale of its shares in L&P and are considering using both a free cash flow (FCF) method and a Calculated Intangible Value (CIV) method to establish a value for L&P's equity.

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Question 2 continued

Exhibit 2: Relevant information for the FCF valuation
Reported operating cash flows in the most recent accounting period were:

Cash inflows (revenue):	US$ 140 million
Cash outflows (costs):	
Invoiced in US$	US$ 32 million
Invoiced in €	€ 36 million

Additional information:

- L&P is funded wholly by equity.
- It is anticipated that operating cash flows will increase by 10% per year for the next three years and then by 5% per year in perpetuity thereafter.
- L&P is committed to a contract to acquire a piece of machinery for € 30 million next week, which will be used in the business for a significant number of years and will thus have a residual value of zero. Special tax depreciation allowances are available on this type of machinery on a straight-line basis over three years.
- It is anticipated that € 5 million will be spent in the coming year on ongoing investment in non-current assets and working capital necessary to maintain L&P's operations. The annual investment will then grow at 5% per year in perpetuity.
- All cash flows, other than the initial purchase of the machinery can be assumed to occur at the end of the year to which they relate.
- The spot exchange rate is currently € 1 = US$ 1.3000. It can be assumed that the exchange rate will remain constant.
- The weighted average cost of capital can be assumed to be 14% for Mamtor and 10%
  for L&P.
- The tax rate applicable to L&P is 30%. Tax is paid in € in the year in which the tax is incurred.

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Question 2 continued

Exhibit 3: CIV valuation

The directors of Mamtor have already calculated a value for L&P's intangible assets using the
CIV method. This calculation is given below. All averages relate to results over the last three years.

	€ million
Average profit before tax for L&P	44.10
Industry average return on tangible assets of 11% multiplied by average L&P tangible assets of € 325m (= 11% × € 325 million)	(35.75)
Value spread	8.35
Less tax at 30%	(2.51)
Post tax value spread	5.84

The post-tax value spread is then discounted at L&P's weighted average cost of capital of 10% to give a CIV value of € 58.40 million (= € 5.84 million/0.10).
A value for L&P is obtained by adding the CIV value of intangible assets to L&P's tangible net asset value of € 295.00 million to give a total value of € 353.40 million. (Where € 353.40 million = € 58.40 million + € 295.00 million.)

Required:

(a) Calculate a value for L&P in € using the free cash flow to firm methodology.
(5 marks)

(b) Explain:

- **The types of intangible asset that L&P is likely to hold.**
- **The rationale behind the CIV method of valuing intangible assets.**

(10 marks)

(c) Compare and contrast the validity of the DCF and CIV valuations of L&P for the purpose of establishing an appropriate asking price for the sale of L&P.
(5 marks)

Professional marks will be awarded for the demonstration of skill in analysis and evaluation, and commercial acumen in your answer.
(5 marks)
(Total: 25 marks)

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Question 3
The capital structure of Keane Plc is as follows:

	£
9% Debenture	5,850,000
5,000,000 Ordinary Shares	27,690,000
200,000 7% Preference Shares of £10	1,950,000
Retained Earnings	3,510,000
	£39,000,000

The Company pays tax at the rate of 35%.
The debentures are selling at par.
The current market price of the preference shares is £25.
The dividend paid on the ordinary shares this year is £2.50.
Of the 5,000,000 ordinary shares in circulation 1,500,000 were recently issued. The shares at that time were trading at a price £6.50.
An investment bank had undertaken the new issue for a commission of 7.5%.

The company expects to see a growth of 8% in dividends in the coming year.

You are required to:

a) Calculate the company's Weighted Average Cost of Capital.
(12 Marks)

b) Critically evaluate the usefulness of Weighted Average Cost of Capital.
(3 Marks)

c) The company is considering investing in new equipment to the value of £2,000,000. Evaluate the best way to raise this finance.
(5 Marks)

(d) In relation to the Capital Asset Pricing Model elucidate the relevance of Beta.
(5 marks)

(Total 25 Marks)

END OF QUESTIONS

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FORMULAE SHEET

Modigliani and Miller proposition 2 (with tax)

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

The capital asset pricing model

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

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

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

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Formulae Sheet continued

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

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

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

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

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MATHEMATICAL TABLES

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

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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

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Standard normal distribution table

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
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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 di > 0, add 0.5 to the relevant number above. If di < 0, subtract the relevant number above from 0.5.

END OF FORMULAE SHEET