



ZIMBABWE EZEKIEL GUTI UNIVERSITY

FACULTY OF BUSINESS, ECONOMICS AND ACCOUNTING

DEPARTMENT OF ACCOUNTING AND FINANCE

EXAMINATION PAPER

COURSE CODE : CAC 214
COURSE TITLE : CORPORATE FINANCE
SPECIAL REQUIREMENTS : STATISTICAL TABLES
DURATION : 3 Hours
LEVEL : 2.1
DATE :

05 JUL 2022

INSTRUCTIONS TO CANDIDATES:

1. No cell phones are allowed in the examination venue
2. Use of silent, non-programmable calculators is allowed
3. Answer ALL questions in both Section A and Section B.
4. Begin each question on a new page in section B.
5. The number of marks for each question or part question is shown in brackets []

SECTION A [MULTIPLE CHOICE] 20 MARKS

Answer all questions in this section

Each question carries 2marks

- 1). Find the compounded amount on \$10000 invested for ten years at 8% per annum compounded annually.
- A. 800
 - B. 10000
 - C. 21589
 - D. 10305
- 2). A five year zero coupon bond is issued with a face value of \$200 and a rate of 6%. What is the current price of the bond?
- A. 138
 - B. 120
 - C. 200
 - D. 268
- 3). Suppose you were offered a 12 year. 10% annual coupon, \$1000 par value bond at a price of \$800. What rate of interest would you earn on your investment if you bought the bond and held it to maturity?
- A. 12%
 - B. 10%
 - C. 13.26%
 - D. 12.26%
- 4) Murehwa ltd is expected to pay a \$1.00 per share dividend at the end of the year. The stock sells for \$20 per share and its required rate of return is 12%. The dividend is expected to grow at a constant rate, g , forever. Determine g for this stock.
- A. 0.07

B. 0.11

C. 0.12

D. 0.24

5). Suppose you deposit \$20000 today in an account that pays simple interest of 10 percent per year. How much will you have at the end of 4 years?

A. 20000

B. 27250

C. 29282

D. 22750

6) Consider 10-year, 12% coupon bond with a par value of \$1 000. Assume the required yield on this bond is 13%. Calculate the value of the bond

A. \$120

B. \$649

C. \$946

D. \$469

7. Consider an 8-year, 12 percent coupon bond with a par value of \$100 on which interest is payable semi-annually. The required return on this bond is 14%. Determine the value of the bond

A. \$96

B. \$100

C. \$14

D. \$90.6

8. Consider a \$2000 par value bond, carrying a coupon rate of 10%, maturing after 8 years. The bond is currently selling for \$1000. What is the YTM on this bond?

A. 9%

B. 23%

C. 80%

D. 10%

9. The main entry barriers that result in positive NPV projects are

- A. Economies of scale, Product Differentiation and Cost advantage
- B. Diseconomies of scale, Product differentiation and Cost advantage
- C. Cost advantage, co-ordination issues, Comparative issues
- D. Economies of scale, Cost advantage and Economic integration

10. The expected dividend per share of Jet is \$10.00. The dividend is expected to grow at the rate of 6% per year. If the price per share now is \$100.00. What is the expected rate of return?

A. 0.16

B. 0.06

C. 0.1

D. 0.6

SECTION B [80MARKS]

Answer all questions in this section

Question one

You are considering investing in two assets and there are three states to the economy as outlined below:

State of economy	Probability of state of economy	Rate of return if	
		Stock A	Stock B
Recession	0.20	-0.15	0.20
Normal	0.50	0.20	0.30
Boom	0.30	0.60	0.40

- a) Calculate the expected return for each stock (4 marks)
- b) Calculate the standard deviations of the two stocks (6 marks)
- c) If you have \$20 000.00 in total to invest and put \$15 000.00 in Stock A and the balance in Stock B, what will be the expected return of your portfolio? (4 marks)
- d) What will be the standard deviation of your portfolio? (5 marks)

Comment on the risks of the stocks and portfolio calculated.

(6 marks)
[25MARKS]

Jones Limited is considering two investment projects, but only has funds to proceed with one of them. The cash-flows associated with each of the project are shown below:

	Project A	Project B
	\$000	\$000
Initial cash outlay	200	250
Cash-flow (net of operating costs)		
Year 1	50	40
Year 2	50	40
Year 3	50	60
Year 4	50	60
Year 5	50	100

a) For each project, calculate the;

(i) Payback period (4marks)

(ii) Accounting rate of return (5marks)

(iii) Net present value, using 10 % discount factor (6marks)

(b) Advise the company on the choice of projects, evaluating the three analytical

techniques.

(15 marks)

[30marks]

Question Three

DD Co has a dividend payout ratio of 40% and has maintained this payout ratio for several years. The current dividend per share of the company is 50c per share and it expects that its next dividend per share, payable in one year's time, will be 52c per share.

The capital structure of the company is as follows:

	\$m	\$m
Equity		
Ordinary shares (par value \$1 per share)	25	
Reserves	<u>35</u>	
		60
Debt		

Bond A (par value \$100)	20	
Bond B (par value \$100)	<u>10</u>	
		<u>30</u>
		<u>90</u>

Bond A will be redeemed at par in ten years' time and pays annual interest of 9%. The current ex interest market price of the bond is \$95.08.

Bond B will be redeemed at par in four years' time and pays annual interest of 8%. The cost of debt of this bond is 7.82% per year. The current ex interest market price of the bond is \$102.01.

Bond A and Bond B were issued at the same time.

DD Co has an equity beta of 1.2. The risk-free rate of return is 4% per year and the average return on the market of 11% per year. Ignore taxation.

Required:

- (a) Calculate the cost of debt of Bond A. (4 marks)
- (b) Discuss the reasons why different bonds of the same company might have different costs of debt. (6 marks)
- (c) Calculate the following values for DD Co:
 - (i) Cost of equity, using the capital asset pricing model; (2 marks)
 - (ii) ex-dividend share price, using the dividend growth model; (3 marks)
 - (iii) Capital gearing (debt divided by debt plus equity) using market values; and (2 marks)
 - (iv) Market value weighted average cost of capital. (3 marks)
- (d) Explain the advantages of equity finance (5marks)

[25MARKS]

END OF EXAMINATION QUESTION PAPER

FORMULA SHEET FOR CAC 214 CORPORATE FINANCE

1. Bond Price = $\sum (C_n / (1+YTM)^n) + P / (1+i)^n$

Where n = Period which takes values from 0 to the nth period till the cash flows ending period,

C_n = Coupon payment in the nth period,

YTM = interest rate or required yield and

P = Par Value of the bond

2. CAPM Required return, $R_i = R_f + \beta (R_m - R_f)$.

Where R_i -required return of stock i,

R_f - Risk free rate,

R_m -Market return rate and

β - Beta coefficient of the market

3. Beta coefficient of stock A, $\beta = \text{Cov}(r_a, r_m) / \sigma^2_m$,

Where r_a = stock A return,

R_m = Market return and

σ^2_m = Market variance

4. Correlation coefficient for Assets A and B., $R = \text{Cov}(A, B) / \sigma_a \sigma_b$

Where σ_a = Standard deviation of stock A and

σ_b = Standard deviation of Stock B.

5. Covariance for stock A and B, $Cov(a,b) = \sum p_i (r_a - E(r_a))(r_b - E(r_b))$

$$\text{or } \sum (r_x - \bar{X})(r_y - \bar{Y}) / (n - 1)$$

6. Expected return of stock X, $E(r) = \sum p x$ or $\sum x/n$

where p = probability of economic state,

x = return of each economic state and

n = number of items.

7. Sharpe's ratio = $(R_p - R_f) / \sigma_p$

where σ_p = standard deviation of the portfolio,

R_p = return on portfolio and

R_f = risk free rate.

8. Treynor's ratio = $(R_p - R_f) / \beta_p$ where β_p = beta of portfolio.

9. Jensen's alpha = $R_i - ((R_f + \beta_p (R_m - R_f)))$

10. Duration = $\sum (t \times PV) / \sum PV$

where t = time and

PV is the present value of the cashflows.

11. Variance of stock A, $\sigma^2_A = \sum p_i (r_a - E(r_a))^2$

12. Portfolio variance, $\sigma^2_{ab} = w_a^2 \sigma_a^2 + w_b^2 \sigma_b^2 + 2w_a w_b COV_{ab}$

or

$$w_a^2 \sigma_a^2 + w_b^2 \sigma_b^2 + 2w_a w_b \sigma_a \sigma_b r_{ab}$$

PRESENT VALUE TABLE

Present value of \$1, that is $(1+r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.

Periods (n)	Interest rates (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
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods (n)	Interest rates (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	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

Cumulative present value of \$1 per annum, Receivable or Payable at the end of each year for n years $\frac{1-(1+r)^{-n}}{r}$

Periods (n)	Interest rates (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	6.495
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
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods (n)	Interest rates (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	4.988	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
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

FORMULAE

PROBABILITY

$A \cup B = A \text{ or } B$. $A \cap B = A \text{ and } B$ (overlap).
 $P(B | A)$ = probability of B , given A .

Rules of Addition

If A and B are mutually exclusive: $P(A \cup B) = P(A) + P(B)$
If A and B are **not** mutually exclusive: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

Rules of Multiplication

If A and B are *independent*: $P(A \cap B) = P(A) * P(B)$
If A and B are **not** independent: $P(A \cap B) = P(A) * P(B | A)$

$E(X) = \sum (\text{probability} * \text{payoff})$

DESCRIPTIVE STATISTICS

Arithmetic Mean

$$\bar{x} = \frac{\sum x}{n} \quad \bar{x} = \frac{\sum fx}{\sum f} \quad (\text{frequency distribution})$$

Standard Deviation

$$SD = \sqrt{\frac{\sum (x - \bar{x})^2}{n}} \quad SD = \sqrt{\frac{\sum fx^2}{\sum f} - \bar{x}^2} \quad (\text{frequency distribution})$$

INDEX NUMBERS

Price relative = $100 * P_1/P_0$ Quantity relative = $100 * Q_1/Q_0$

Price:
$$\frac{\sum w * \left(\frac{P_1}{P_0}\right)}{\sum w} * 100$$

Quantity:
$$\frac{\sum w * \left(\frac{Q_1}{Q_0}\right)}{\sum w} * 100$$

TIME SERIES

Additive Model

Series = Trend + Seasonal + Random

Multiplicative Model

Series = Trend * Seasonal * Random

FINANCIAL MATHEMATICS

Compound Interest (Values and Sums)

Future Value S , of a sum of X , invested for n periods, compounded at $r\%$ interest

$$S = X[1 + r]^n$$

Annuity

Present value of an annuity of £1 per annum receivable or payable for n years, commencing in one year, discounted at $r\%$ per annum:

$$PV = \frac{1}{r} \left[1 - \frac{1}{[1 + r]^n} \right]$$

Perpetuity

Present value of £1 per annum, payable or receivable in perpetuity, commencing in one year, discounted at $r\%$ per annum:

$$PV = \frac{1}{r}$$

LEARNING CURVE

$$Y_x = aX^b$$

where:

Y_x = the cumulative average time per unit to produce X units;

a = the time required to produce the first unit of output;

X = the cumulative number of units;

b = the index of learning.

The exponent b is defined as the log of the learning curve improvement rate divided by log 2.

INVENTORY MANAGEMENT

Economic Order Quantity

$$EOQ = \sqrt{\frac{2C_o D}{C_h}}$$

where: C_o = cost of placing an order
 C_h = cost of holding one unit in Inventory for one year
 D = annual demand