AFRICA UNIVERSITY

COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES

NMEC 207: MONEY AND BANKING

END OF SEMESTER EXAMINATIONS

NOVEMBER 2024

LECTURER: MR T MASESE

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Answer Question 1 and any other THREE questions
2. All questions carry equal marks
3. Start each question on a new page.
4. Show all workings where applicable

QUESTION 1

a. Financial markets perform the essential economic function of channeling funds from households, firms, and governments that have saved surplus funds by spending less than their income to those that have a shortage of funds because they wish to spend more than their income. With the aid of an appropriate flow diagram explain how the financial system facilitates economic activity through direct and indirect finance. Explain the role of financial markets and financial intermediaries (10 marks)

b. Dairibord develops a new carbohydrate free ice-cream. As the popularity of this product increases, the firm (unlike its customers) expects to grow quite rapidly at 20% per year for the next 3 years. Thereafter, as the market share of this new food increases, the firm's growth rate will reach a steady state. At that point the firm starts growing at the same rate as the overall economy of 5% per year indefinitely. Assume that the market's required rate of return on this share is 14% and that the firm's most recent dividend was $2 per year. Calculate the price of the Dairibord share (15 marks)

[25 marks]

QUESTION 2

a. Whether it's a public company, private company, corporation, or a real estate company, firms have to raise capital. Briefly explain any five common methods used by firms to raise capital from both the money and capital markets (10 marks)

b. Explain the following statement. "An asset held as part of a portfolio is generally less risky than the same asset held in isolation" Briefly discuss the main sources of systematic and unsystematic risk. How do investors reduce unsystematic risk? (5 marks)

c. The following table shows three states of the economy, their probabilities of occurrence and expected returns to securities issued by Kay's Limited, an indigenous Zimbabwean firm.

State of the Economy	**Probability of the State**	**Expected Return (%)**
Recession	0.2	10
Normal	0.5	20
Boom	0.3	25

Calculate the expected return and standard deviation of Kays' stock on the market (10 marks)

[25 marks]

QUESTION 3

a. What is meant by 'investment environment? Outline and discuss the seven elements of the investment environment that one should be aware of (8 marks)

b. The most successful investors were not made in a day and investment is a process. Briefly outline the first seven steps of your expedition into investing and what you would look out for along the way (8 marks)

c. Suppose an investor has $250 000 to invest in two securities or assets A and B that he has identified on domestic financial markets. It is further given that if the funds are invested in the two assets A and B, the investor wealth would be increased to $240 000 and $400 000 with probabilities of 60% and 40% respectively. Calculate the variance, standard deviation, expected wealth and profit from investment of the funds of the investor in securities A and B. (9 marks)

[25 marks]

QUESTION 4

a. Zimbabwe has changed its currency several times because of loss of value and loss of public confidence. What the characteristics of good money that were lost by the currencies that have been discontinued? Discuss the various classifications of money starting with M1

(10 marks)

b. Briefly explain the effects of asymmetric information in financial markets. What are some of the tools used in financial markets to reduce the problems of adverse selection and moral hazard in financial markets? (10 marks)

c. Calculate the expected return, variance and standard deviation for a share with probability distribution outlined in the table below.

Outcome	**Probability**	**Share Return**
Recession	10%	-40%
Expansion	60%	20%
Boom	30%	50

(5 marks

[25 marks]

QUESTION 5

a. Assume that you plan to buy a housing stand 5 years from now and you estimate that you can save $2500 per year. You plan to deposit the money in a bank that pays 8% interest and you will make the first deposit at the end of the year. How much will you have after 5 years? How will your answer change if the first deposit was made immediately**?** **(5 marks)**

b. Briefly explain the difference between:

i. Primary and secondary markets for financial assets **(2 marks)**

ii. Money and capital markets **(2 marks)**

iii. Exchange and over-the-counter markets **(2 marks)**

iv. Private placement and initial public offer **(2 marks)**

v. Systematic and unsystematic risk **(2 marks)**

d. Audrey has been offered four investment opportunities, all equally priced at $45 000. Because the opportunities differ in risk, Audrey's required returns are not the same for each opportunity. The cash flows and required returns for each opportunity are summarized below:

Opportunity	**Cash Flows**	**Required Return (Discount rate)**
A	$8000 at the end of 5 years	15%
B	Year Amount 1 $24000 2 11000 3 18000 4 15000 5 13000 6 7000	10%
C	$6000 at the end of each year for the next 30 years	10%
D	$9000 at the beginning of each year for the next 20 years.	15%

Find the present value of each of the four investment opportunities and advice which, if any, of the opportunities are acceptable (10 marks)

[25 marks]

END OF EXAMINATION

PRESENT VALUE TABLES AND FORMULAE

Present value table

Present value of 1.00 unit of currency, 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 1.00 unit of currency 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	Interest rates (r)									
(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	3.498	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 Table

$$\text{Bond's value} = V_B = \frac{INT}{(1+r_d)^1} + \frac{INT}{(1+r_d)^2} + \cdots + \frac{INT}{(1+r_d)^N} + \frac{M}{(1+r_d)^N}$$
$$= \sum_{t=1}^{N} \frac{INT}{(1+r_d)^t} + \frac{M}{(1+r_d)^N}$$

$$\text{Value of stock} = \hat{P}_0 = \text{PV of expected future dividends}$$
$$= \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + \cdots + \frac{D_\infty}{(1+r_s)^\infty}$$
$$= \sum_{t=1}^{\infty} \frac{D_t}{(1+r_s)^t}$$

Value of Preference share $PS_0 = D_p / r_p$

$$\text{Expected rate of return} = \text{Expected dividend yield} + \text{Expected growth rate, or capital gains yield}$$
$$\hat{r}_s = \frac{D_1}{P_0} + g$$

Price of a stock today:

$$\bullet\ P_0 = \frac{D_1}{r - g}$$

Expected Return = $\sum P_i k_i$

Standard Deviation:

$$\sigma = \sqrt{p_1(R_1 - R^e)^2 + p_2(R_2 - R^e)^2 + \ldots + p_n(R_n - R^e)^2}$$

Standard deviation of a portfolio:

$\sigma_p = \sum W_i \times \sigma_i$

Covariance (A, B) $= \sum pi(R_A - ER_A)(R_B - ER_B)$

Correlation coefficient (A, B) or r_{AB} = (Covariance (A, B))/($\sigma_A \times \sigma_B$) where σ_A and σ_B

The variance of the two asset portfolio formula:

$\sigma_P^2 = W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + 2W_A \times W_B \times Cov(A, B)$ where W_A and W_B are weights and σ_A^2 and σ_B^2 are variances of the stocks A and B respectively.

Variance of the portfolio becomes $\sigma_P^2 = W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + 2W_A \times W_B \times r_{AB} \times \sigma_A \times \sigma_B$.

Correlation coefficient, $\boldsymbol{r_{A,B}} = \frac{\boldsymbol{Cov\ (A,B)}}{(\boldsymbol{\sigma_A} \times \boldsymbol{\sigma_B})}$.

FV = PV x $(1 + r)^n$ = PV ($FVIF_{i,n}$)

FVA_n (Annuity Due) = PMT ($FVIFA_{i,n}$) (1+i)

PV = $\boldsymbol{FV}/(\boldsymbol{1}+\boldsymbol{r})^{\boldsymbol{n}}$ = FV x$\boldsymbol{1}/(\boldsymbol{1}+\boldsymbol{r})^{\boldsymbol{n}}$ = FV ($PVIF_{i,n}$)