Strathmore
UNIVERSITY

STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCES
BBS FINANCIAL ENGINEERING, FINANCIAL ECONOMICS & ACTUARIAL SCIENCE
END OF SEMESTER EXAMINATION
BSF 1204 CORPORATE FINANCE

DATE: April 2021 Time: 2 Hours

Instructions

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

Question 1

a) You must evaluate the purchase of proposed equipment for the R&D department. The initial investment outlay is Ksh178,000. The equipment will be sold after 3 years for Ksh50,000. The applicable depreciation rate is 25% on a straight-line basis. The equipment would require an Ksh8,000 increase in net working capital (spare parts inventory). The project would have no effect on revenues, but it should save the firm Ksh50,000 per year in before-tax labor costs. The firm's tax rate is 40%. If the company's cost of capital is 12%, should the equipment be purchased? Explain. **(11 marks)**

b) Express Ltd has annual sales revenue of Ksh6 million and all sales are on 30 days' credit. Contribution is 60% of sales and the company currently has no bad debts. Receivables are financed by an overdraft at an annual interest rate of 7%. Express Ltd plans to offer an early settlement discount of 1.5% for payment within 15 days and to extend the maximum credit offered to 60 days. The company expects that these changes will increase annual credit sales by 5%, while also leading to additional incremental costs equal to 0.5% of sales. The discount is expected to be taken by 30% of customers, with the remaining customers taking an average of 60 days to pay. Evaluate whether the proposed changes in credit policy will increase the profitability of Express Ltd. **(9 marks)**

c) Discuss the factors to be considered in formulating the dividend policy of a stock-exchange listed company. **(10 marks)**

(TOTAL: 30 MARKS)

Question 2

a) Redding Co operates in an industry which has recently been deregulated as the government seeks to increase competition in the industry.

Redding Co plans to replace an existing machine and must choose between two machines. Machine 1 has an initial cost of Ksh200,000 and will have a scrap value of Ksh25,000 after four years. Machine 2 has an initial cost of Ksh225,000 and will have a scrap value of Ksh50,000 after three years. Annual maintenance costs of the two machines are as follows:

Year	**1**	**2**	**3**	**4**
Machine 1 (Ksh per year)	25,000	29,000	32,000	35,000
Machine 2 (Ksh per year)	15,000	20,000	25,000	

Where relevant, all information relating to this project has already been adjusted to include expected future inflation. Taxation and tax allowable depreciation must be ignored in relation to Machine 1 and Machine 2.

Redding Co has a cost of capital of 12%.

Determine which of the two machines should be selected by Redding Co. **(10 marks)**

b) Better Co is reviewing investment proposals that have been submitted by divisional managers. The investment funds of the company are limited to Ksh800,000 in the current year. Details of three possible investments, none of which can be delayed, are given below.

Project 1

An investment of Ksh300,000 in workstation assessments. Each assessment would be on an individual employee basis and would lead to savings in labour costs from increased efficiency and from reduced absenteeism due to work-related illness. Savings in labour costs from these assessments in nominal terms are expected to be as follows:

Year	***1***	***2***	***3***	***4***	***5***
Cash flows (Ksh'000)	85	90	95	100	95

Project 2

An investment of Ksh450,000 in individual workstations for staff that is expected to reduce administration costs by Ksh140,800 per annum in nominal terms for the next five years.

Project 3

An investment of Ksh400,000 in new ticket machines. Net cash savings of Ksh120,000 per annum are expected in current price terms and these are expected to increase by 3.6% per annum due to inflation during the five-year life of the machines.

Better Co has a nominal cost of capital of 12% and taxation should be ignored.

Determine the best way for Better Co to invest the available funds and calculate the resultant NPV:

i) on the assumption that each of the three projects is divisible.

ii) on the assumption that none of the projects are divisible. **(10 marks)**

(TOTAL: 20 MARKS)

Question 3

a) Xerox Co. wishes to minimise its inventory costs. Annual demand for a raw material costing Ksh12 per unit is 60,000 units. Inventory management costs for this raw material are as follows:

Ordering cost: Ksh6 per order

Holding cost: Ksh0·75 per unit per year

The supplier of this raw material has offered a bulk purchase discount of 1.5% for orders of 10,000 units or more. If bulk purchase orders are made regularly, it is expected that annual holding cost for this raw material will increase to Ksh2 per unit per year.

i. Calculate the total cost of inventory for the raw material when using the economic order quantity. **(5 marks)**

ii. Determine whether accepting the discount offered by the supplier will minimise the total cost of inventory for the raw material. **(5 marks)**

b) In looking to reduce the working capital funding requirement, the financial controller of Sammer Africa is considering factoring credit sales. The company's annual turnover is Ksh2.5m of which 90% are credit sales. Bad debts are typically 3% of credit sales. The average receivables period is 2.5 months. The offer from the factor is conditional on the following.

1) The factor will take over the sales ledger of Sammer Africa completely.

2) 80% of the value of credit sales will be advanced immediately (as soon as sales are made to the customer) to Sammer Africa, the remaining 20% will be paid to the company one month later. The factor charges 15% per annum on credit sales for

advancing funds in the manner suggested. The factor is normally able to reduce the receivables' collection period to one month.

3) The factor offers a 'no recourse' facility whereby they take on the responsibility for dealing with bad debts. The factor is normally able to reduce bad debts to 2% of credit sales.
4) A charge for factoring services of 4% of credit sales will be made.

The salary of the Sales Ledger Administrator (Ksh12,500) and overhead costs of the credit control department, amounting to Ksh2,000 per annum, would be saved under the proposals. Sammer Africa's cost of overdraft finance is 12% per annum.

Evaluate the proposal to factor the sales ledger by comparing Sammer Africa's existing receivable collection costs with those that would result from using the factor (assuming that the factor can reduce the receivables collection period to one month). **(10 marks)**

(TOTAL: 20 MARKS)

Question 4

Summary financial information for Umeme Co is given below, covering the last two years.

	2020	**2021**
	Ksh'000	**Ksh'001**
INCOME STATEMENT (EXTRACT)		
Revenue	74,521	68,000
Cost of sales	28,256	25,772
Salaries and wages	20,027	19,562
Other costs	11,489	9,160
Profit before interest and tax	14,749	13,506
Interest	1,553	1,863
Tax	4,347	3,726
Profit after interest and tax	8,849	7,917
Dividends payable	4,800	3,100

	2020	**2021**
	Ksh'000	**Ksh'001**
STATEMENT OF FINANCIAL POSITION (EXTRACT)		
Shareholders' funds	39,900	35,087
Longterm debt	14,000	17,500
Other information		
Number of shares in issue ('000)	14,000	14,000
Share price	Ksh8.82	Ksh7.41

Using profitability, debt and shareholders' investment ratios, discuss the performance of Umeme Co over the last two years. **(20 marks)**

Question 5

Machakos Ltd. wishes to raise funds amounting to Ksh10 million to finance a project in the following manner:

Ksh6 million from debt; and
Ksh4 million from floating new ordinary shares.

The present capital structure of the company is made up as follows:

1. 600,000 fully paid ordinary shares of Ksh10 each
2. Retained earnings of Ksh4 million
3. 200,000, 10% preference shares of Ksh20 each.
4. 40,000 6% long term bonds of Ksh150 each.

The current market value of the company‟s ordinary shares is Ksh60 per share. The expected ordinary share dividends in a year's time is Ksh2.40 per share. The average growth rate in both dividends and earnings has been 10% over the past ten years and this growth rate is expected to be maintained in the foreseeable future.

The company's long term bonds currently have a market price of Ksh100 each. The bonds will mature in 100 years. The preference shares were issued four years ago and sell at face value.

Required:

a) Calculate the cost of:

i) Ordinary share capital **(2 marks)**
ii) Debt capital **(3marks)**
iii) Preference share capital. **(2 marks)**

b) Calculate the company's current weighted average cost of capital. **(6 marks)**

c) Calculate the company's marginal cost of capital if it raised the additional Ksh10 million as envisaged. (Assume a tax rate of 30%). **(7marks)**

(TOTAL: 20 MARKS)

Formula Sheet

Economic order quantity

$$= \sqrt{\frac{2C_0D}{C_h}}$$

Miller–Orr Model

$$\text{Return point} = \text{Lower limit} + \left(\frac{1}{3} \times \text{spread}\right)$$

$$\text{Spread} = 3\left[\frac{\frac{3}{4} \times \text{transaction cost} \times \text{variance of cash flows}}{\text{interest rate}}\right]^{\frac{1}{3}}$$

The Capital Asset Pricing Model

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

The weighted average cost of capital

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

$$\textbf{IRR} = a + \frac{NPV_a}{NPV_a - NPV_b}(b - a)$$

Present Value Table

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

Where r = discount rate
n = number of periods until payment

Discount rate (r)

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	1
2	0·980	0·961	0·943	0·925	0·907	0·890	0·873	0·857	0·842	0·826	2
3	0·971	0·942	0·915	0·889	0·864	0·840	0·816	0·794	0·772	0·751	3
4	0·961	0·924	0·888	0·855	0·823	0·792	0·763	0·735	0·708	0·683	4
5	0·951	0·906	0·863	0·822	0·784	0·747	0·713	0·681	0·650	0·621	5
6	0·942	0·888	0·837	0·790	0·746	0·705	0·666	0·630	0·596	0·564	6
7	0·933	0·871	0·813	0·760	0·711	0·665	0·623	0·583	0·547	0·513	7
8	0·923	0·853	0·789	0·731	0·677	0·627	0·582	0·540	0·502	0·467	8
9	0·914	0·837	0·766	0·703	0·645	0·592	0·544	0·500	0·460	0·424	9
10	0·905	0·820	0·744	0·676	0·614	0·558	0·508	0·463	0·422	0·386	10
11	0·896	0·804	0·722	0·650	0·585	0·527	0·475	0·429	0·388	0·350	11
12	0·887	0·788	0·701	0·625	0·557	0·497	0·444	0·397	0·356	0·319	12
13	0·879	0·773	0·681	0·601	0·530	0·469	0·415	0·368	0·326	0·290	13
14	0·870	0·758	0·661	0·577	0·505	0·442	0·388	0·340	0·299	0·263	14
15	0·861	0·743	0·642	0·555	0·481	0·417	0·362	0·315	0·275	0·239	15
(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	1
2	0·812	0·797	0·783	0·769	0·756	0·743	0·731	0·718	0·706	0·694	2
3	0·731	0·712	0·693	0·675	0·658	0·641	0·624	0·609	0·593	0·579	3
4	0·659	0·636	0·613	0·592	0·572	0·552	0·534	0·516	0·499	0·482	4
5	0·593	0·567	0·543	0·519	0·497	0·476	0·456	0·437	0·419	0·402	5
6	0·535	0·507	0·480	0·456	0·432	0·410	0·390	0·370	0·352	0·335	6
7	0·482	0·452	0·425	0·400	0·376	0·354	0·333	0·314	0·296	0·279	7
8	0·434	0·404	0·376	0·351	0·327	0·305	0·285	0·266	0·249	0·233	8
9	0·391	0·361	0·333	0·308	0·284	0·263	0·243	0·225	0·209	0·194	9
10	0·352	0·322	0·295	0·270	0·247	0·227	0·208	0·191	0·176	0·162	10
11	0·317	0·287	0·261	0·237	0·215	0·195	0·178	0·162	0·148	0·135	11
12	0·286	0·257	0·231	0·208	0·187	0·168	0·152	0·137	0·124	0·112	12
13	0·258	0·229	0·204	0·182	0·163	0·145	0·130	0·116	0·104	0·093	13
14	0·232	0·205	0·181	0·160	0·141	0·125	0·111	0·099	0·088	0·078	14
15	0·209	0·183	0·160	0·140	0·123	0·108	0·095	0·084	0·074	0·065	15

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

Discount rate (r)

Periods (n)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	(n)
1	0·990	0·980	0·971	0·962	0·952	0·943	0·935	0·926	0·917	0·909	1
2	1·970	1·942	1·913	1·886	1·859	1·833	1·808	1·783	1·759	1·736	2
3	2·941	2·884	2·829	2·775	2·723	2·673	2·624	2·577	2·531	2·487	3
4	3·902	3·808	3·717	3·630	3·546	3·465	3·387	3·312	3·240	3·170	4
5	4·853	4·713	4·580	4·452	4·329	4·212	4·100	3·993	3·890	3·791	5
6	5·795	5·601	5·417	5·242	5·076	4·917	4·767	4·623	4·486	4·355	6
7	6·728	6·472	6·230	6·002	5·786	5·582	5·389	5·206	5·033	4·868	7
8	7·652	7·325	7·020	6·733	6·463	6·210	5·971	5·747	5·535	5·335	8
9	8·566	8·162	7·786	7·435	7·108	6·802	6·515	6·247	5·995	5·759	9
10	9·471	8·983	8·530	8·111	7·722	7·360	7·024	6·710	6·418	6·145	10
11	10·368	9·787	9·253	8·760	8·306	7·887	7·499	7·139	6·805	6·495	11
12	11·255	10·575	9·954	9·385	8·863	8·384	7·943	7·536	7·161	6·814	12
13	12·134	11·348	10·635	9·986	9·394	8·853	8·358	7·904	7·487	7·103	13
14	13·004	12·106	11·296	10·563	9·899	9·295	8·745	8·244	7·786	7·367	14
15	13·865	12·849	11·938	11·118	10·380	9·712	9·108	8·559	8·061	7·606	15
(n)	**11%**	**12%**	**13%**	**14%**	**15%**	**16%**	**17%**	**18%**	**19%**	**20%**	**(n)**
1	0·901	0·893	0·885	0·877	0·870	0·862	0·855	0·847	0·840	0·833	1
2	1·713	1·690	1·668	1·647	1·626	1·605	1·585	1·566	1·547	1·528	2
3	2·444	2·402	2·361	2·322	2·283	2·246	2·210	2·174	2·140	2·106	3
4	3·102	3·037	2·974	2·914	2·855	2·798	2·743	2·690	2·639	2·589	4
5	3·696	3·605	3·517	3·433	3·352	3·274	3·199	3·127	3·058	2·991	5
6	4·231	4·111	3·998	3·889	3·784	3·685	3·589	3·498	3·410	3·326	6
7	4·712	4·564	4·423	4·288	4·160	4·039	3·922	3·812	3·706	3·605	7
8	5·146	4·968	4·799	4·639	4·487	4·344	4·207	4·078	3·954	3·837	8
9	5·537	5·328	5·132	4·946	4·772	4·607	4·451	4·303	4·163	4·031	9
10	5·889	5·650	5·426	5·216	5·019	4·833	4·659	4·494	4·339	4·192	10
11	6·207	5·938	5·687	5·453	5·234	5·029	4·836	4·656	4·486	4·327	11
12	6·492	6·194	5·918	5·660	5·421	5·197	4·988	4·793	4·611	4·439	12
13	6·750	6·424	6·122	5·842	5·583	5·342	5·118	4·910	4·715	4·533	13
14	6·982	6·628	6·302	6·002	5·724	5·468	5·229	5·008	4·802	4·611	14
15	7·191	6·811	6·462	6·142	5·847	5·575	5·324	5·092	4·876	4·675	15