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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 23 May 2019. **Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Explain four buy side participants in the alternative investments environment. (4 marks)

(b) Examine four characteristics of mezzanine debt. (4 marks)

(c) The following financial data was extracted from the books of Umoja Shopping Mall for the year ended 31 December 2018:

	Sh."000"
Net Operating Income (NOI)	80,000
Cash and cash equivalents	20,000
Accounts receivable	15,000
Total debt	250,000
Sundry creditors	50,000
Non-cash rent	2,000
Full-year acquisition adjustments	1,000
Land held for future development	10,000
Prepayments	5,000

Additional information:

1. Growth of NOI for the year 2019 is projected to be 1.25%.
2. Capitalisation rate based on recent comparable transaction is 8.0%.
3. Number of ordinary shares outstanding is 15,000,000.

Required:

The net asset value per share (NAVPS) for the Umoja Shopping Mall. (7 marks)

(d) Valley Ltd. is an agri-business company. The founders believe they can sell the company for Sh.40 million in 5 years time. The founders require Sh.5 million in capital now and they currently hold 1 million ordinary shares. The venture capital decides that given the high risk of this company, the discount rate of 40% is appropriate.

Required:

(i) The pre-money valuation for the venture capital. (1 mark)

(ii) The post-money valuation for the venture capital. (1 mark)

(iii) The ownership fraction. (1 mark)

(iv) The price per share using the net present value (NPV) method with a single financing round. (2 marks)

(Total: 20 marks)

QUESTION TWO

(a) Highlight three benefits of farmland as an alternative asset. (3 marks)

(b) Assume a piece of farmland costs Sh.110,000 per acre and an investor purchases 10 acres of the land. The investor finances 75% through bank loan and puts 25% equity in the deal. The interest rate for the loan is 5%.

Additional information:

1. The investor leases the farm to a local farmer for Sh.12,000 per acre per year earning a return of Sh.120,000 per annum.
2. Property taxes amount to Sh.30,000 per annum.
3. Insurance amounts to Sh.10,000 per year.

Required:

(i) Return on equity (ROE) on the farmland. (3 marks)

(ii) Operating return on asset (ROA) on the farmland. (3 marks)

(c) A property was let for a five year term, three years ago at Sh.400,000 per year. Rent review occurs every five years. The estimated rental value in the current market is Sh.450,000 and the risks yield on comparable fully let properties is 5%. The incremental rent is to be discounted at a rate of 6%.

Required:

Estimate the value of the property using the layer method. (4 marks)

(d) The following information relates to a Leveraged Buyout (LBO) transaction valued at Sh.800 million:

Additional information:

1. Exit occurs in seven years at a projected multiple of 1.8 of the company's original cost.
2. The LBO is financed through a debt to equity ratio of 65% and 35% respectively.
3. The Sh.280 million equity is composed of:
   - Sh.200 million in preference shares held by the private equity firm.
   - Sh.75 million in equity held by the private equity firm.
   - Sh.5 million in equity held by management equity participation.
4. Preference shares are guaranteed at 14% compound annual return payable at exit.
5. The equity of the private equity (P/E) firm is promised 90% of the firm's residual value at exit after the creditor's and preference shares are paid.
6. Management equity participation receives 10% balance.
7. By exit, the company will have paid Sh.300 million of the initial Sh.520 million in debt using operating cash flows.

Required:

The payoff multiple for the equity claimants (private equity). (7 marks)

(Total: 20 marks)

QUESTION THREE

(a) Discuss two exit strategies available for private equity investors. (4 marks)

(b) (i) Describe three types of risks that could be faced by hedge fund managers. (3 marks)

(ii) Tom Ltd., a fund of hedge funds, has the following fee structure:

- 2/20 underlying fund fees with incentive fees calculated independently.
- Tom Ltd. fees are calculated net of all underlying fund fees.
- 1% management fee (based on year end market value).
- 10% incentive fee calculated net of management fee.
- The fund and all underlying funds have no hurdle rate or high-water mark (HWM) fee conditions.

In the latest year, Tom Ltd.'s funds value increased from Sh.100 million to Sh.133 million before deduction of management and incentive fees of the fund or underlying funds.

Required:

The total fee earned by all the funds in the aggregate. (7 marks)

(c) Rachel Wamae owns a newly issued government agency fixed rate pass through mortgage backed security (MBS) and wants to evaluate the sensitivity of its principal cash flow to the following interest rate scenario:

Interest rates instantaneously decline by 250 basis points for all maturities, remain there for one year, and then,

Interest rates instantaneously increase 350 basis points for all maturities and remain there for the next year.

Currently, the MBS is priced close to par and the yield curve is flat. Rachel does not expect the shape of the yield curve to change during the interest rate scenario.

Rachel also wants to evaluate the price sensitivity of her MBS to changes in interest rates. She knows that modified duration and effective duration are two possible measures she could use to evaluate price sensitivity.

Rachel also owns a newly issued government agency collateralised mortgage obligation interest only (IO) security.

Required:

(i) Discuss the reasons why the MBS principal cash flows change. (2 marks)

(ii) Justify with reasons the duration measure that Rachel Wamae should use to evaluate the price sensitivity of her MBS. (2 marks)

(iii) Explain whether the interest only, IO, security price increases or decreases in the first year of the interest rate scenario described above. (2 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Summarise four characteristics that differentiate the commodity indices from other alternative investment indices. (4 marks)

(b) A fund manager takes a fully collateralised long futures position in nearby coffee futures contract at the quoted futures price of Sh.865.0. Three months later, the entire futures position is rolled when the near term futures price is Sh.877.0 and the further term futures price is Sh.883.0. During the three month period between the time that the initial long position was taken and the rolling of the contact, the collateral earned an annualised rate of 0.60%.

Required:

The three month's total return on the coffee futures trade. (5 marks)

(c) Bomboo Ltd. is an all-equity financed firm. After a recent re-organisation, the company is considering issuing a debt in form of a collateralised mortgage obligation (CMO). The issuer is considering the two CMO structures as highlighted below:

Structure 1

Tranche	**Par amount Sh. "million"**	**Coupon rate (%)**
A	150	6.50
B	100	6.75
C	200	7.25
D	150	7.75
E	100	8.00
F	500	8.50

Structure 2

Tranche	**Par amount Sh. "million"**	**Coupon rate (%)**
A	150	6.50
B	100	6.75
C	200	7.25
D	150	7.75
E	100	8.00
F	200	8.25
G	300	?

Tranches A to E are a sequence of planned amortisation class (PAC), tranche F is a PAC 2 and tranche E is a support tranche without a schedule.

In Structure 2, tranche G is created from tranche F in Structure 1.

Required:

(i) Determine the coupon rate for tranche G assuming that the combined coupon rate for tranches F and G in Structure 2, is 8.5%. (4 marks)

(ii) Explain the effect on the value and average life of tranches A-E including the PAC 2 in Structure 2. (2 marks)

(iii) Explain whether there is any difference in the average life variability of tranche G in Structure 2 and tranche F in structure 1. (2 marks)

(d) An investments analyst is considering the following asset backed sécurity (ABS) structure:

Tranche	Amount Sh."million"
Senior tranche	170
Subordinate tranche A	50
Subordinate tranche B	20
	240

The amount in the pool are worth Sh.280 million.

Required:

(i) Amount of overcollateralisation. (1 mark)

(ii) Amount of losses that the senior tranche investors begin to lose money. (2 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Discuss four types of mortgage designs in the context of mortgage backed securities (MBS). (4 marks)

(b) A tranche of a mortgage backed security (MBS) has been split to create a floater with a principal of Sh.64,583,333 and an inverse floater of Sh.12,916,667.

The tranche has a coupon rate of 8.5%

Required:

(i) The capitalisation rate for the inverse floater when the coupon rate for the floater is 91-day treasury bill plus 1%. (4 marks)

(ii) The capitalisation rate for the floater when the coupon rate is 91-day treasury bill plus 1% and a floor is imposed on the inverse floater of zero. (2 marks)

(c) Describe four loan level call protection mechanism that cushions an investor of a commercial mortgage backed security (CMBS) from exposure to loan prepayment risks. (4 marks)

(d) Fredrick Onyango owns a mortgage pass through in which the remaining mortgage balance at the beginning of the month is Sh.290 million and the Conditional Prepayment Rate (CPR) is 6%. The scheduled principal payment is Sh.3 million.

Required:

(i) The single-monthly mortality rate (SMM). (2 marks)

(ii) The estimated prepayments. (2 marks)

(iii) The SMM for month 5 assuming a benchmark of 100. (2 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	1160	.0923	.0588	.0378	.0304	.0245	0160	.0105	.0046	.0021	.0010	0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,n} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250