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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 2 September 2021.   **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 characteristics of alternative investments that differentiate them from traditional investments.(4 marks)

(b)   Evaluate four types of taxation that could be levied on alternative investments products.   (4 marks)

(c)   Differentiate between the following types of stripped mortgage backed securities (MBS):

    (i)   Principal only (PO) strips.   (2 marks)

    (ii)   Interest only (IO) strips.   (2 marks)

(d)   An analyst has gathered the following data to value a real estate investment trust (REIT):
REIT valuation projections and assumptions
Appropriate discount rate   8.5%
Expected dividend per share (DPS), 1 year from today   Sh.1.00
Expected dividend per share (DPS), 2 years from today   Sh.1.06
Long term growth rate in dividends, starting in year 3   5.0%

Required:
The intrinsic value of the REIT on a per share basis using the two step dividend discount model.   (4 marks)

(e)   Bermuda Life Insurance Company (BLIC) is an active lender on commercial real estate property and has provided you with the following information relating to property A:

    1.   The loan term is 5 years.
    2.   Interest rate of 5.75% interest only.
    3.   Maximum loan to value (LTV) of 75% and minimum debt service coverage ratio of 1.5 times.
    4.   The net operating income is as provided below:

Year	1	2	3
Net operating income (Sh.)	2,775,840	2,859,119	2,994,889

    5.   The appraised value of the property is Sh.48 million.

Required:
The maximum loan amount on the property.   (4 marks)
(Total: 20 marks)

QUESTION TWO

(a)   Explain two uses of Monte Carlo Simulation Model in valuation of mortgage backed securities (MBS).   (4 marks)

(b)   Alfred Ngugi is evaluating an agency collateralised mortgage obligation (CMO) structure using the Monte Carlo Simulation Model based on a 10% volatility assumption:

Tranche	Z-spread	Option adjusted spread (OAS)
A	200	170
B	185	150
C	250	140

Required:

(i)   Determine the option cost (in basis point) for each tranche.   (2 marks)

(ii)   Determine which tranche appears to be most attractive.   (2 marks)

(c)   Examine four advantages of investing in a real estate operating company (REOC).   (4 marks)

(d)   Fahari Real Estate Investment and Business Advisors does valuation on behalf of clients buying and selling real estate. The firm has been provided with the following data regarding Boma apartment complex as well as recent sales in the area:

Boma apartment complex	Sh."000"
Gross potential rental income	300,000
Estimated vacancy and collection losses	6%
Insurance	17,500
Taxes	7,500
Utilities	17,500
Repair and maintenance	30,000
Depreciation	35,000
Interest on proposed financing	27,500

Additional information on buildings recently sold:

	Office buildings Sh."000"	Apartments Sh."000"
Net operating income	750,000	150,000
Sales price	5,000,000	1,250,000

All incomes are on annual basis.

Required:

(i)   Determine the value of Boma apartment complex.   (5 marks)

(ii)   Describe three challenges of using comparable companies to value private targets.   (3 marks)

          (Total: 20 marks)

QUESTION THREE

(a)   Discuss three reasons for creating collateralised debt obligations (CDOs).   (6 marks)

(b)   In relation to commodities investment:

(i)   Differentiate between "basis" and "calendar spread".   (2 marks)

(ii)   Outline three roles of commodity indexes.   (3 marks)

(iii)   The November price of an agricultural commodity is Sh.2.50 per kilogram, the effective interest rate is 1% and the storage cost per kilogram are Sh.0.05 per month. The commodity is stored from November to February.

Required:

Compute the February arbitrage free price.   (3 marks)

(c)   Fund A with an initial investment of Sh.20 million liquidates with Sh.24 million cash after one year. The hurdle rate is 15% and the incentive fee is 20%.

Required:

Determine the distribution to fund manager assuming:

(i)   The fund uses a hard hurdle.   (3 marks)

(ii)   The fund has a soft hurdle and a 50% catch up rate.   (3 marks)

          (Total: 20 marks)

QUESTION FOUR

(a)   Summarise five unique risks of investing in hedge funds.   (5 marks)

(b)   Christopher Wamalwa, an investor in real estate in Kwetu County is considering taking a residential mortgage facility offered by Nyumba Housing Finance to construct a rental apartment.

Additional information:
1.   The mortgage company advanced him Sh.6 million repayable within 30 years.
2.   The interest rate is 12% per annum payable on a monthly basis.
3.   Payment consist of both interest and principal.

Required:
(i)   Construct a constant payment mortgage (CPM) schedule for the first six months.   (7 marks)

(ii)   Describe one advantage and one disadvantage of using constant mortgage amortisation (CMA) approach in analysing mortgage payments.   (2 marks)

(c)   Alex Mutiso owns a mall using mortgage financing, spread over ten years period.

Additional information:
1.   The beginning mortgage balance in month 33 is Sh.297,825.
2.   Prepayment in month 33 is Sh.1,841,347.
3.   Outstanding loan amount is Sh.358,326,766.

Required:
(i)   Single monthly mortality rate (SMM).   (2 marks)

(ii)   Conditional prepayment rate (CPR).   (2 marks)

(iii)   Interpret your answers in (c) (i) and (c) (ii) above.   (2 marks)
                                                        (Total: 20 marks)

QUESTION FIVE

(a)   Explain the following terms in the context of private equity:
(i)   Carried interest.   (1 mark)

(ii)   Claw-back provision.   (1 mark)

(iii)   Vintage year.   (1 mark)

(iv)   J – curve effect.   (1 mark)

(b)   Suggest two reasons why leveraged buyout funds (LBO) are less risky compared to venture capital funds. (4 marks)

(c)   Hekima fund has a 2 and 20 fee arrangement with no hurdle rate and a net asset value (NAV) of Sh.500 million. The NAV increased to Sh.625 million at the end of year before fees. Management fees are distributed annually based on the start of the year NAV.

Required:
(i)   Annual management fee.   (1 mark)

(ii)   Incentive fee.   (1 mark)

(iii)   Total annual fee.   (1 mark)

(iv)   Ending NAV after fees.   (1 mark)

(v)   Percentage return net of fees.   (1 mark)

(d)   You have recently landed a job as the Chief Investment Officer (CIO) at Delta Limited. One of your client is considering investing in real estate and you are now evaluating three potential real estate investment options as follows:

I   **Direct investment in a hotel building:**
Expected net operating income (years 1 – 7)   Sh.7 million
Expected net operating income (year 8)   Sh.8.5 million
Required return on equity investment   12%
Net operating income growth rate after 8 years   3.5%

II   **Real estate investment trust (REIT)**
Recent net operating income   Sh.140 million
Non cash rents   Sh.10 million
Full year adjustments for acquisition   Sh.10 million
Other assets   Sh.40 million
Total liabilities   Sh.250 million
Current market price per share (MPS)   Sh.130
Outstanding ordinary shares   12 million
Going in capitalisation rate   8%
Net operating income growth rate   2.4%

III   **Real estate operating company (REOC)**
Expected adjusted funds from operation (AFFO) in year 8   Sh.14.5 million
Holding period   7 years
Present value of all dividends for 7 years   Sh.42 million
Outstanding ordinary shares   2 million
Capitalisation rate   8%
Growth rate from year 8   2.4%

Additional information:
1.   The hotel building under consideration has existing tenant with long-term lease that will expire in seven years.
2.   The real estate operating company (REOC) terminal value at the end of the seven years is to be based on a price to adjusted funds from operations (AFFO) multiple of 12 times (12x).

Required:
(i)   The estimated value of the hotel building using the discounted cash flow approach.   (3 marks)

(ii)   Determine whether the real estate investment trust (REIT) is fairly priced using the net asset value (NAV) approach.   (3 marks)

(iii)   The estimated value per share of the real estate operating company (REOC).   (1 mark)
    (Total: 20 marks)

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Present Value Interest factor of 1 Received at the End of *n* Periods at r Percent:

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

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6944	0.6504	0.6400	0.5917
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050	0.2326	0.1789	0.1678	0.1226
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.0935	0.0610	0.0550	0.0330
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079	0.0649	0.0397	0.0352	0.0195
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514	0.0261	0.0135	0.0115	0.0053
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382	0.0181	0.0088	0.0074	0.0031
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116	0.0042	0.0016	0.0012	*
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	*	*
36	0.6989	0.4902	0.3450	0.2437	0.1727	0.1227	0.0875	0.0626	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065	0.0048	0.0014	*	*	*
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	*	*	*
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	*	*	*	*

Present Value Interest factors for Annuity of 1 Discounted at r Percent for *n* Periods:

$$PVIFA_{r,n} = [1 - 1/(1+r)^n]/r$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4568	1.4400	1.3609
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9813	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5887	2.4043	2.3616	2.1662
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6893	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386	3.6046	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873	4.3436	3.8372	3.4212	3.3289	2.9247
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065	4.0310	3.5655	3.4631	3.0190
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332	4.1925	3.6819	3.5705	3.0915
11	10.368	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.255	10.575	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.4392	3.8514	3.7251	3.1903
13	12.134	11.348	10.635	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	4.5327	3.9124	3.7801	3.2233
14	13.004	12.106	11.296	10.563	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	4.6106	3.9616	3.8241	3.2487
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5755	4.6755	4.0013	3.8593	3.2682
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685	4.7296	4.0333	3.8874	3.2832
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487	4.7746	4.0591	3.9099	3.2948
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178	4.8122	4.0799	3.9279	3.3037
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	4.8435	4.0967	3.9424	3.3105
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288	4.8696	4.1103	3.9539	3.3158
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125	5.9731	4.8913	4.1212	3.9631	3.3198
22	19.660	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.4424	8.7715	8.1757	7.6446	7.1695	6.7429	6.3587	6.0113	4.9094	4.1300	3.9705	3.3230
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.5802	8.8832	8.2664	7.7184	7.2297	6.7921	6.3988	6.0442	4.9245	4.1371	3.9764	3.3254
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.7066	8.9847	8.3481	7.7843	7.2829	6.8351	6.4338	6.0726	4.9371	4.1428	3.9811	3.3272
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0971	4.9476	4.1474	3.9849	3.3286
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.4269	8.6938	8.0552	7.4957	7.0027	6.5660	6.1772	4.9789	4.1601	3.9950	3.3321
35	29.409	24.999	21.487	18.665	16.374	14.498	12.948	11.655	10.567	9.6442	8.8552	8.1755	7.5856	7.0700	6.6166	6.2153	4.9915	4.1644	3.9984	3.3330
36	30.108	25.489	21.832	18.908	16.547	14.621	13.035	11.717	10.612	9.6765	8.8786	8.1924	7.5979	7.0790	6.6231	6.2201	4.9929	4.1649	3.9987	3.3331
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.7791	8.9511	8.2438	7.6344	7.1050	6.6418	6.2335	4.9966	4.1659	3.9995	3.3332
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.9148	9.0417	8.3045	7.6752	7.1327	6.6605	6.2463	4.9995	4.1666	3.9999	3.3333