KASNEB

CIFA PART III SECTION 6

ADVANCED PORTFOLIO MANAGEMENT
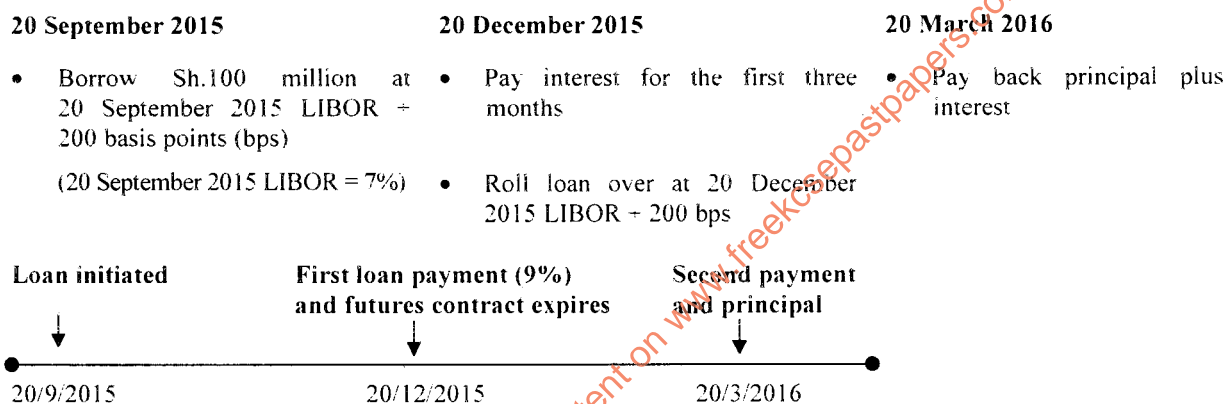
THURSDAY: 26 November 2015.
Time Allowed: 3 hours.

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

QUESTION ONE

(a) Discuss five criteria that could assist a portfolio manager in appropriately specifying asset classes. (5 marks)

(b) George Onyango is considering a possible six-month, Sh.100 million LIBOR based floating-rate bank loan to fund an infrastructure project. However, he fears that there might be a possible rise in the LIBOR rate by December 2015 and intends to use December 2015 Eurodollar futures contract to hedge risk.

The futures contract expires on 20 December 2015, has a Sh.1 million contract size, and a discount yield of 7.3%. George Onyango will ignore the cash flow implications of marking-to-market, initial margin requirements and any timing mismatch between exchange traded futures contract cash flows and the interest payments due in March 2016. The terms of the loan are as shown below:

20 September 2015	**20 December 2015**	**20 March 2016**
• Borrow Sh.100 million at 20 September 2015 LIBOR + 200 basis points (bps)	• Pay interest for the first three months	• Pay back principal plus interest
(20 September 2015 LIBOR = 7%)	• Roll loan over at 20 December 2015 LIBOR + 200 bps	

Loan initiated	**First loan payment (9%) and futures contract expires**	**Second payment and principal**
↓	↓	↓
20/9/2015	20/12/2015	20/3/2016

Required:

(i) Formulate George Onyango's 20 September 2015 floating-rate to fixed-rate strategy using the Eurodollar futures contract. (5 marks)

(ii) Show that the strategy in (b) (i) above would result in a fixed rate loan, assuming an increase in the LIBOR rate to 7.8% by 20 December 2015 which remains at 7.8% through 20 March 2016. (5 marks)

(c) The market value of an emerging market-fixed income investment fund is Sh.74.9 million. The duration of the portfolio is 8.165. According to a consulting economist, the prevailing interest rates are likely to have an unexpected decline over the next month. Based on this forecast, the portfolio manager contemplates increasing the duration of the fund's entire bond duration to 10.11. The futures contract that the fund would use is currently priced at Sh.130.012 and has a duration of 9.556. It is also assumed that the conversion factor for the futures contract is 1.059.

Required:

(i) Explain whether the fund would need to buy or to sell the futures contract. Justify your answer. (1 mark)

(ii) The approximate number of futures contracts that would be needed to change the duration of the bond portfolio. (4 marks)

(Total: 20 marks)

QUESTION TWO

(a) Explain the following fixed income portfolio management strategies:

(i) Full replication approach. (2 marks)

(ii) Enhanced indexing by matching primary risk factors. (2 marks)

(iii) Enhanced indexing by small risk factor mismatches. (2 marks)

(iv)   Active management by larger risk factor mismatches.   (2 marks)

(v)   Full-blown active management.   (2 marks)

(b)   Evaluate three components of return for commodities futures contracts.   (6 marks)

(c)   Justine Kangongo is a senior portfolio manager advising international clients. On 1 September 2015, one of Kangongo's clients, an American, bought a Canadian oil company for 1 million CAD (Canadian dollars) and sold Canadian stock index futures (December maturity) for the same amount to hedge the Canadian stock market risk. The stock index futures contract has a multiplier of CAD 25. The current stock index futures price is CAD 2,000. The client sells 20 contracts. The Canadian dollar dropped from 1.0 United States dollars (USD) on 1 September 2015 to 0.90 USD on 1 October 2015. During the same period, the stock index and stock index futures dropped by 10% in CAD, while the portfolio only loses by 7% in CAD.

Required:
The profit or loss of this alpha strategy in USD given that the client does not engage in currency hedging.   (4 marks)
(Total: 20 marks)

QUESTION THREE
(a)   (i)   In relation to global credit bond portfolio management, explain the term "relative value".   (2 marks)

(ii)   Describe three strategic portfolio implications of the bullet structure with an immediate maturity.   (6 marks)

(b)   A portfolio manager is evaluating two new asset classes that might provide a mean-variance improvement for his portfolio. He gathers the following data:

| Asset class | Asset class expectations | | Correlation with the current portfolio |
	Expected return	Standard deviation	
Non-domestic developed market equity	8.0%	14.0%	0.70
Emerging market equity	9.0%	18.0%	0.50

Additional information:
1.   The risk free rate is 2.0%.
2.   The current portfolio consists of 60% domestic equities and 40% domestic fixed-income securities.
3.   The current portfolio has an expected return of 6.25% and a standard deviation of 9.5%.

Required:
Using Sharpe ratio, determine whether an addition of non-domestic developed market equity would provide a mean-variance improvement to the current portfolio.   (3 marks)

(c)   Charles Keter presented the following performance result. The manager invests in a small number of sectors within a broad equity universe. The objective of the manager is to outperform a custom benchmark:

| | Performance results | | | |
| | weight (%) | | Return % | |
Industry sector	Portfolio	Custom benchmark	Portfolio	Custom benchmark
Agricultural	21.30	21.90	4.55	4.90
Banking	36.00	34.80	3.60	3.10
Investment	19.20	20.90	3.90	3.30
Telecommunication and technology	23.50	22.40	1.30	-0.20
Total portfolio	100.00	100.00	3.42	2.80

Required:
(i)   The pure sector allocation for the agricultural sector of the portfolio.   (3 marks)

(ii)   The within-sector allocation (security selection) return for the investment sector of the portfolio.   (3 marks)

(iii)   The allocation (selection interaction) return for the banking sector of the portfolio.   (3 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Examine five limitations of Sharpe ratio as a performance appraisal measure of a hedge fund. (5 marks)

(b) John Kioko, a Chief Investment Officer (CIO) of a large pension fund has prepared the performance attribution table shown below to assist in evaluation of the performance of the equity real estate portfolio:

Portfolio type	Portfolio allocation %	Index allocation %	Portfolio returns %	Index return %
Office	55	35	4.47	6.07
Retail	20	25	8.23	7.51
Warehouse	20	15	6.01	7.52
Apartment	5	25	0.76	2.94
Total	100	100		

Required:

(i) Index return. (1 mark)

(ii) Effects of property selection. (2 marks)

(iii) Effects of market timing. (2 marks)

(iv) Active return. (2 marks)

(v) Effects of active management. (2 marks)

(c) Jack Sitoti, an investment consultant, has collected the following information which he considers appropriate to compare the performance of two managers; Manager 1 and Manager 2.

Five year performance (annualised)

Performance measure	Manager 1	Manager 2
Rate of return (%)	21.13	21.13
Sharpe ratio	1.17	1.21
M^2 (%)	18.72	19.27
Active risk (%)	2.17	4.18
Information ratio	0.52	0.27
Treynor measure (%)	19.15	17.17
Risk-free rate (%)	2.75	2.75

Required:

Using three risk-adjusted performance measures, explain the causes of the difference in the two managers' performance. (6 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Evaluate three economically significant differences that distinguish "conventional index mutual funds" from "indexed exchange traded funds (ETF)". (6 marks)

(b) Describe the following portfolio rebalancing strategies:

(i) Buy-and-hold strategy. (2 marks)

(ii) Constant-mix strategy. (2 marks)

(iii) Constant-proportion portfolio insurance (CPPI) strategy. (2 marks)

(c)   As a portfolio manager of Fiduciary Investment Services (FIS), one of your duties is to ensure timely execution of trades ordered by the clients.

The following information relates to one of your clients:

1.   A client ordered for 1,000 shares of East African Cotton Limited (EACL) to be purchased on Tuesday, with a benchmark price of Sh.10 per share.

2.   On Tuesday, 600 shares were purchased at a price of Sh.10.02 per share. The commissions and fees for this trade was Sh.20.00. The closing price on that Tuesday was Sh.9.99 per share.

3.   On Wednesday, 100 more shares were bought at Sh.10.08 per share with commissions and fees amounting to Sh.12.00. The closing price was Sh.10.01 per share on that day.

4.   The remaining shares were not purchased and the order was cancelled on Thursday at the close of the market. EACL shares closed at Sh.10.05 per share on Thursday.

Required:
(i)   Implementation shortfall for the above trade.   (4 marks)

(ii)   Components of the implementation shortfall for the above trade.   (4 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:

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

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