

JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA**PGDM / PGDM (M) / PGDM (SM)****FOURTH TRIMESTER (Batch 2021-23)****END TERM EXAMINATIONS, January 2022****Set-1****TERM IV - Group 2**

Course Name	INVESTMENT MANAGEMENT	Course Code	FIN 10222
Max. Time	2 hours	Max. Marks	40 MM

1. Answer all the questions. All step by step workings have to be shown clearly. Without working, marks will not be awarded.
2. It is a close book examination. However, One page formula sheet is being attached along with necessary PV tables. Notations have the usual meaning.
3. You are allowed to use your own scientific / financial calculator only. Exchange of calculators is strictly prohibited.
4. Use of mobile phone is strictly prohibited.
5. All the necessary precautions have been taken to make a flawless question paper and necessary information has been provided to answer the questions, as such, do not disturb the invigilators present in the hall.

CLO3, BT IV

1. A) Ms. Arpita Kapoor is a portfolio manager of Sumer Consultants Ltd. She manages portfolios that lie on the efficient frontier and CML (Capital market line). She asks Manish Thakur, her immediate subordinate to review the portfolio of two clients Ratnam Finance (Pvt) Ltd. and Sukhsagar Investment Ltd. The expected returns of the two portfolios are quite different. Manish finds that Sukhsagar's portfolio return is identical with that of Nifty 50 return and concludes that Sukhsagar's portfolio is better than that of Ratnam. Do you agree with Manish's conclusion? Examine and conclude
—
a) by drawing securities market line (Securities Market Line),

b) i) What would be the correlation coefficient between Sukhsagar return and Nifty 50 return ?

ii) What would be the beta of Sukhsagar ? Explain your answers.

c) Manish further observes that Ratnam has a higher return (than Sukhsagar) but lower Sharp ratio than that of Sukhsagar. His first impression is Ratnam has higher non-systematic risk.

Distinguish systematic and non- systematic risk with examples. Do you think that Arpita will agree with Manish's views that Ratnam Finance may have a higher non-systematic risk? Justify

B) Vigilance Securities evaluates the performance of 2 common stocks. Srikant Telecom and Fortune Lab respectively. They gather the following information :-

- a) Risk-free rate is 5%
- b) Expected rate of return of sensex is 12% (market proxy)
- c) Beta of Srikant stock is 1.5
- d) Beta of Fortune stock 0.8.

Based on the analysis, Vigilance forecasts the returns of two stocks are - 13.25% for Srikant, 12% for Fortune. Calculate the required rate of return of both the stocks as per CAPM. Analyse whether each stock is undervalued, fairly valued or overvalued following CAPM. How will this valuation distortion will be corrected ? Analyse and conclude.

Marks : 6+ 10

CLO 3, BTIV

2. A) The current yield curve for default- free zero coupon bonds are as follows –

Maturity (Years)	YTM
1	10%
2	11%
3	12%

Examine –

- a) What are the sequences of implied 1 year forward rates ? (Assume pure expectation hypothesis).
- b) If market expectations are accurate, examine with reasons what will be the YTM of 1 year and 2 year zero coupon bonds next year.

c) What should be the current price of a 3- year maturity bond with a 12% coupon rate paid annually ? If you purchase it at that price, what would be your total expected rate of return over the next year (coupon plus price change)?

B) Day count convention – 30/360. The 6 month treasury bill spot rate is 4%, and the 1 year treasury bill spot rate is 5%. What is the implied 6 month forward rate for the 6 months from Now ? Examine.

10+4

CLO4, BTIV

3. A) HDFC Dynamic debt fund portfolio consists of 75% GOI bond, portfolio modified duration is 2.10 (category average 2.74) with a YTM of 6.42% (category average 6.65%). Analyse and compare the risk and return of the HDFC fund with category average. Current yield is 7%. If there is an increase of 50 basis yield then what will be its NAV (current NAV being Rs.73) of the HDFC debt fund portfolio? How the HDFC fund NAV behave with respect to category average value ? Compare.

B) A 6% coupon bond paying interest annually has a modified duration of 10 years, sells for Rs.800, and priced at YTM of 8%. If the YTM increases to 9%, what is the predicted change in price using duration concept. Conclude with working.

C) You are comparing the yield curve of GOI bond having 5 years remaining maturity with that of a highly liquid AAA rated corporate bond with same coupon and same remaining maturity as that of GOI bond. You find that the corporate bond yield curve remains a slightly above the GOI bond yield curve. Why ? Analyse and conclude.

3+3+4

FORMULA SHEET

1. PV of Annuity $= C \times \left[\frac{1 - \frac{1}{(1+r)^T}}{r} \right]$

1. (a). PV of a single cash flow in period $t = \frac{C_t}{(1+r)^t}$ $\left| \begin{array}{l} C \rightarrow \text{Cash flow} \\ r \rightarrow \text{required rate of return (Discount rate)} \end{array} \right.$

2. CAPM: $r_i = r_f + \beta_i (r_m - r_f)$

2(a) $\beta_i = \frac{\text{Cov}(r_i, r_m)}{\sigma_m^2}$

3. Duration of t period bond

$$= \frac{\sum_{t=1}^T t \times \frac{C_t}{(1+y)^t}}{\text{Price (P)}}, \quad \left| \begin{array}{l} y = \text{YTM or} \\ \text{simply yield, per} \\ \text{period.} \end{array} \right.$$

4. Price of a bond $= \sum_{t=1}^T \frac{C_t}{(1+y)^t}$

5. Modified duration (or, MD) $= \frac{\text{Duration}}{(1+y)}$

6. $\frac{\Delta P}{P} = -MD \times \Delta y$

TABLE A.2 Present value of \$1 to be received after t periods $= 1/(1 + r)^t$

Period	Interest Rate								
	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	.9901	.9804	.9709	.9616	.9524	.9434	.9346	.9259	.9174
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7936	.7722
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019
9	.9143	.8368	.7664	.7026	.6446	.5919	.5438	.5002	.4604
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224
11	.8963	.8043	.7224	.6496	.5847	.5266	.4751	.4289	.3875
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555
13	.8787	.7730	.6810	.6006	.5300	.4688	.4150	.3677	.3262
14	.8700	.7579	.6611	.5775	.5051	.4423	.3876	.3405	.2992
15	.8613	.7430	.6419	.5553	.4810	.4173	.3621	.3162	.2746
16	.8528	.7284	.6232	.5339	.4591	.3939	.3387	.2919	.2519
17	.8444	.7142	.6050	.5134	.4369	.3714	.3160	.2700	.2314
18	.8360	.7002	.5874	.4938	.4155	.3509	.2959	.2502	.2120
19	.8277	.6864	.5703	.4746	.3957	.3306	.2765	.2317	.1945
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2146	.1784
21	.8114	.6598	.5375	.4388	.3589	.2942	.2416	.1982	.1637
22	.8034	.6468	.5219	.4220	.3418	.2775	.2257	.1839	.1502
23	.7954	.6342	.5067	.4057	.3256	.2618	.2109	.1693	.1376
24	.7876	.6217	.4919	.3901	.3101	.2470	.1971	.1577	.1264
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0316
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134

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TABLE A.3 Present value of an annuity of \$1 per period for t periods = $[1 - 1/(1 + r)^t]/r$

Number of Periods	Interest Rate								
	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9340	.9250	.9174
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5318
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348
9	8.5660	8.1822	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177
11	10.3675	9.7868	9.2520	8.7606	8.3064	7.8869	7.4987	7.1390	6.8062
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4889
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862
15	13.8654	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5695	8.0667
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126
17	15.5623	14.2919	13.1683	12.1657	11.2741	10.4773	9.7632	9.1216	8.5439
18	16.3983	14.9920	13.7595	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285
21	18.8570	17.0112	15.4150	14.0292	12.8212	11.7641	10.8355	10.0168	9.2922
22	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	11.0812	10.2007	9.4424
23	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	11.2722	10.3741	9.5802
24	21.2434	18.9139	16.9355	15.2470	13.7986	12.5504	11.4693	10.5288	9.7066
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8225
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617

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PTO

TABLE A.3 Present value of an annuity of \$1 per period for t periods = $[1 - 1/(1 + r)^t]/r$

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	1%	2%	3%	4%	5%	6%	7%	8%	9%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9340	.9250	.9174
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5316
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8860	7.4957	7.1330	6.7952
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9036	7.4899
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862
15	13.8654	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5695	8.0867
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126
17	15.5623	14.2919	13.1681	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1265
21	18.8570	17.0112	15.4150	14.0292	12.8212	11.7641	10.8355	10.0168	9.2922
22	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	11.0612	10.2007	9.4424
23	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	11.2722	10.3741	9.5802
24	21.2434	18.9139	16.9355	15.2470	13.7986	12.5504	11.4693	10.5288	9.7066
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617

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10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4566	1.3916	1.3315	1.2760
2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663	1.6735
3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957	1.9658
3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452	2.1807
4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342	2.3388
4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775	2.4550
5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860	2.5404
5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681	2.6033
6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304	2.6495
6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776	2.6834
6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133	2.7084
7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5827	3.9124	3.4272	3.0404	2.7266
7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609	2.7403
7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764	2.7502
7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882	2.7575
8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0871	2.7629
8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039	2.7668
8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090	2.7697
8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129	2.7718
8.6487	7.5620	6.6870	6.3125	5.9731	5.3837	4.8913	4.1212	3.5514	3.1158	2.7734
8.7715	7.6446	6.7429	6.3587	6.0113	5.4099	4.9094	4.1300	3.5558	3.1180	2.7746
8.8832	7.7184	6.7921	6.3988	6.0442	5.4321	4.9245	4.1371	3.5592	3.1197	2.7754
8.9847	7.7843	6.8351	6.4338	6.0726	5.4509	4.9371	4.1428	3.5619	3.1210	2.7760
9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220	2.7765
9.1629	7.8952	6.9027	6.4860	6.1172	5.4768	4.9589	4.1501	3.5663	3.1242	2.7775
9.2431	7.9408	6.9250	6.5018	6.1335	5.4882	4.9666	4.1559	3.5712	3.1250	2.7778
9.3148	7.9805	6.9427	6.5143	6.1463	5.4954	4.9735	4.1601	3.5714	3.1250	2.7778