國立台灣科技大學九十七學年度碩士班招生試題

系所組別： 財務金融研究所碩士班

科　　目： 財務管理

※滿分100分

1. The following is the current *market-value* balance sheet of Ben & Ben Company. Suppose that Ben & Ben's bonds have a face value of $50.

Assets		Liabilities and Equity	
Net working capital	$20	Bond outstanding	$25
Fixed assets	10	Common stock	5
Total assets	$30	Total liabilities and shareholders' equity	$30

Who would gain or lose from the following maneuvers? Bond holders or shareholders? Please explain in details.

a. Ben & Ben pays a $10 cash dividend. (5%)
b. Ben & Ben halts operations, sells its fixed assets for $6, and converts net working capital into $20 cash. It invests its $26 in Treasury bills. (5%)
c. Ben & Ben encounters a risky investment opportunity requiring a $10 initial investment with NPV=$0. It finances the project by its internal working capital. (5%)
d. Ben & Ben finances the investment opportunity in part (c) by issuing more more bonds with the same security, seniority, and so on, as the existing bonds. (5%)
e. Ben & Ben finances the investment opportunity in part (c) by issuing more common stock. (5%)

2. Please explain the *dividend-irrelevance theory*. It is well documented that stock prices tend to rise when firms announce an increase in their dividend payouts. How then can it be said that dividend policy is irrelevant? (25%)

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3. (30%) NTUST Autos claims that it offers a "zero-interest" payment scheme on a car with the list price NT$600,000 for 5 years, i.e. paying NT$10,000 per month for the next 60 months. In addition, NTUST Autos also gives you NT$100,000 discount of the list price if you buy this car in cash today. Note: All results are rounded to the second decimal place.

a. (10%) Is the "zero-interest" payment scheme a financing way free of interest? If it is not, what is the implicit annual interest rate of the "zero-interest" payment scheme?

b. (5%) Suppose you can find a 24-month 6% car loan to buy this car today. How much will you pay for each month if the loan is repaid in equal monthly installments?

c. (15%) If you are allowed to prepay NT$20,000 per month for the car loan in problem (b), please fill the grids in the following table and indicate how many months is needed to pay off this loan.

Month	Beginning monthly balance	Monthly payment	Interest for this month	Principal scheduled	Principal prepayment
1					20,000.00
2					20,000.00
3					⋮
⋮					⋮
⋮					⋮

注意：填充題務必寫於答案紙上.

※ The following table shows the $PVIFA_{r,t}$ (Present Value Interest Factor for Annuity)

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INTEREST RATES

Periods	0.5%	0.67%	0.75%	1%	1.5%	2%	2.5%	3%	3.5%	4%	4.5%	5%	6%	7%
1	0.9950	0.9934	0.9926	0.9901	0.9852	0.9804	0.9756	0.9709	0.9662	0.9615	0.9569	0.9524	0.9434	0.9346
2	1.9851	1.9802	1.9777	1.9704	1.9559	1.9416	1.9274	1.9135	1.8997	1.8861	1.8727	1.8594	1.8334	1.8080
3	2.9702	2.9604	2.9556	2.9410	2.9122	2.8839	2.8560	2.8286	2.8016	2.7751	2.7490	2.7232	2.6730	2.6243
4	3.9505	3.9342	3.9261	3.9020	3.8544	3.8077	3.7620	3.7171	3.6731	3.6299	3.5875	3.5460	3.4651	3.3872
5	4.9259	4.9015	4.8894	4.8534	4.7826	4.7135	4.6458	4.5797	4.5151	4.4518	4.3900	4.3295	4.2124	4.1002
6	5.8964	5.8625	5.8456	5.7955	5.6972	5.6014	5.5081	5.4172	5.3286	5.2421	5.1579	5.0757	4.9173	4.7665
7	6.8621	6.8170	6.7946	6.7282	6.5982	6.4720	6.3494	6.2303	6.1145	6.0021	5.8927	5.7864	5.5824	5.3893
8	7.8230	7.7652	7.7366	7.6517	7.4859	7.3255	7.1701	7.0197	6.8740	6.7327	6.5959	6.4632	6.2098	5.9713
9	8.7791	8.7072	8.6716	8.5660	8.3605	8.1622	7.9709	7.7861	7.6077	7.4353	7.2688	7.1078	6.8017	6.5152
10	9.7304	9.6429	9.5996	9.4713	9.2222	8.9826	8.7521	8.5302	8.3166	8.1109	7.9127	7.7217	7.3601	7.0236
11	10.6770	10.5724	10.5207	10.3676	10.0711	9.7868	9.5142	9.2526	9.0016	8.7605	8.5289	8.3064	7.8869	7.4987
12	11.6189	11.4958	11.4349	11.2551	10.9075	10.5753	10.2578	9.9540	9.6633	9.3851	9.1186	8.8633	8.3838	7.9427
13	12.5562	12.4130	12.3423	12.1337	11.7315	11.3484	10.9832	10.6350	10.3027	9.9856	9.6829	9.3936	8.8527	8.3577
14	13.4887	13.3242	13.2430	13.0037	12.5434	12.1062	11.6909	11.2961	10.9205	10.5631	10.2228	9.8986	9.2950	8.7455
15	14.4166	14.2293	14.1370	13.8651	13.3432	12.8493	12.3814	11.9379	11.5174	11.1184	10.7395	10.3797	9.7122	9.1079
16	15.3399	15.1285	15.0243	14.7179	14.1313	13.5777	13.0550	12.5611	12.0941	11.6523	11.2340	10.8378	10.1059	9.4466
17	16.2586	16.0217	15.9050	15.5623	14.9076	14.2919	13.7122	13.1661	12.6513	12.1657	11.7072	11.2741	10.4773	9.7632
18	17.1728	16.9089	16.7792	16.3983	15.6726	14.9920	14.3534	13.7535	13.1897	12.6593	12.1600	11.6896	10.8276	10.0591
19	18.0824	17.7903	17.6468	17.2260	16.4262	15.6785	14.9789	14.3238	13.7098	13.1339	12.5933	12.0853	11.1581	10.3356
20	18.9874	18.6659	18.5080	18.0456	17.1686	16.3514	15.5892	14.8775	14.2124	13.5903	13.0079	12.4622	11.4699	10.5940
21	19.8880	19.5357	19.3628	18.8570	17.9001	17.0112	16.1845	15.4150	14.6980	14.0292	13.4047	12.8212	11.7641	10.8355
22	20.7841	20.3997	20.2112	19.6604	18.6208	17.6580	16.7654	15.9369	15.1671	14.4511	13.7844	13.1630	12.0416	11.0612
23	21.6757	21.2579	21.0533	20.4558	19.3309	18.2922	17.3321	16.4436	15.6204	14.8568	14.1478	13.4886	12.3034	11.2722
24	22.5629	22.1105	21.8891	21.2434	20.0304	18.9139	17.8850	16.9355	16.0584	15.2470	14.4955	13.7986	12.5504	11.4693
25	23.4456	22.9575	22.7188	22.0232	20.7196	19.5235	18.4244	17.4131	16.4815	15.6221	14.8282	14.0939	12.7834	11.6536
26	24.3240	23.7988	23.5422	22.7952	21.3986	20.1210	18.9506	17.8768	16.8904	15.9828	15.1466	14.3752	13.0032	11.8258
27	25.1980	24.6346	24.3595	23.5596	22.0676	20.7069	19.4640	18.3270	17.2854	16.3296	15.4513	14.6430	13.2105	11.9867
28	26.0677	25.4648	25.1707	24.3164	22.7267	21.2813	19.9649	18.7641	17.6670	16.6631	15.7429	14.8981	13.4062	12.1371
29	26.9330	26.2896	25.9759	25.0658	23.3761	21.8444	20.4535	19.1885	18.0358	15.9837	16.0219	15.1411	13.5907	12.2777
30	27.7941	27.1088	26.7751	25.8077	24.0158	22.3965	20.9303	19.6004	18.3920	17.2920	16.2889	15.3725	13.7648	12.4090
32	29.5033	28.7312	28.3557	27.2696	25.2671	23.4683	21.8492	20.3888	19.0689	17.8736	16.7889	15.8027	14.0840	12.6466
34	31.1955	30.3320	29.9128	28.7027	26.4817	24.4986	22.7238	21.1318	19.7007	18.4112	17.2468	16.1929	14.3681	12.8540
36	32.8710	31.9118	31.4468	30.1075	27.6607	25.4888	23.5563	21.8323	20.2905	18.9083	17.6660	16.5469	14.6210	13.0352
38	34.5299	33.4707	32.9581	31.4847	28.8051	26.4406	24.3486	22.4925	20.8411	19.3679	18.0500	16.8679	14.8460	13.1935
40	36.1722	35.0090	34.4469	32.8347	29.9158	27.3555	25.1028	23.1148	21.3551	19.7928	18.4016	17.1591	15.0463	13.3317
48	42.5803	40.9619	40.1848	37.9740	34.0426	30.6731	27.7732	25.2667	23.0912	21.1951	19.5356	18.0772	15.6500	13.7305
50	44.1428	42.4013	41.5664	39.1961	34.9997	31.4236	28.3623	25.7298	23.4556	21.4822	19.7620	18.2559	15.7619	13.8007
60	51.7256	49.3184	48.1734	44.9550	39.3803	34.7609	30.9087	27.6756	24.9447	22.6235	20.6380	18.9293	16.1614	14.0392
120	90.0735	82.4215	78.9417	69.7005	55.4985	45.3554	37.9337	32.3730	28.1111	24.7741	22.1093	19.9427	16.6514	14.2815
180	118.504	104.641	98.5934	83.3217	62.0956	48.5844	39.5304	33.1703	28.5130	24.9785	22.2142	19.9969	16.6662	14.2856
240	139.581	119.554	111.145	90.8194	64.7957	49.5686	39.8933	33.3057	28.5640	24.9980	22.2216	19.9998	16.6667	14.2857
300	155.207	129.565	119.162	94.9466	65.9009	49.8685	39.9757	33.3286	28.5705	24.9998	22.2222	20.0000	16.6667	14.2857
360	166.792	136.283	124.282	97.2183	66.3532	49.9599	39.9945	33.3325	28.5713	25.0000	22.2222	20.0000	16.6667	14.2857

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4. (20%) Suppose the following regression equation is adopted to study the return behavior for funds.

$$r_{\text{fund},t} = a + b \cdot r_{f,t} + c \cdot r_{m,t} + d \cdot \text{SMB}_t + e \cdot \text{HML}_t + \varepsilon,$$

where

$r_{f,t}$ – the average risk-free interest rate level,

$r_{m,t}$ – the equity market return,

SMB_t – the return on the portfolio of small firm stocks minus the return on the portfolio of large firm stocks,

HML_t – the return on the portfolio of high book-to-market-ratio stocks minus the return on the portfolio of low book-to-market-ratio stocks.

a. (4%) Is the estimator $\hat{b}$ generally positive or negative for a bond fund? Why?

b. (4%) What is the theoretic value of the estimator $\hat{c}$ for an equity market index fund? Why?

c. (4%) Is the estimator $\hat{d}$ generally positive or negative for a fund with the small-company investment strategy? Why?

d. (4%) Is the estimator $\hat{e}$ generally positive or negative for a fund with the growth-stock investment strategy? Why?

e. (4%) Suppose the regression results for Fund NTUST are $\hat{b}=0$, $\hat{c}=0.8$, $\hat{d}=-0.7$, and $\hat{e}=0.5$. Please analyze the investment philosophy of the managers of Fund NTUST.