所別：財務金融學系碩士班 甲組 科目：財務管理

一、

(1) Mark Young has just won the state lottery, paying $50,000 a year for 20 years. He is to receive his first payment a year from now. The state advertises this as the Million Dollar Lottery because $1,000,000=$50,000 X 20. If the interest rate is 8 percent, what is the true value of the lottery?【五分】

(2) Stuart Gabriel, a second-year MBA student, has just been offered a job at $80,000 a year. He anticipates his salary increasing by 9 percent a year until his retirement in 40 years. Given an interest rate of 20 percent, what is the present value of his lifetime salary?【五分】

二、

(1) Sarro Shipping, Inc., expects to earn $1 million per year in perpetuity if it undertakes no new investment opportunities. There are 100,000 shares of stock outstanding, so earnings per share equal $10 ($1,000,000/100,000). The firm will have an opportunity at date 1 to spend $1,000,000 in a new marketing campaign. The new campaign will increase earnings in every subsequent period by $210,000 (or $2.10 per share). This is a 21-percent return per year on the project. The firm's discount rate is 10 percent. What is the value per share before and after deciding to accept the marketing campaign?【五分】

(2) Cumberland Book Publishers has EPS of $10 at the end of the first year, a dividend-payout ratio of 40 percent, a discount rate of 16 percent, and a return on its retained earnings of 20 percent. Because the firm retains some of its earnings each year, it is selecting growth opportunities each year. This is different from Sarro Shipping, which had a growth opportunity in only one year. We wish to calculate the price per share using both the dividend-growth model and the NPVGO model.【五分】

三、

(1) Suppose you have invested only in two stocks, A and B. You expect that returns on the stocks depend on the following three states of economy, which are equally likely to happen.

State of Economy	Return on Stock A(%)	Return on Stock B(%)
Bear	6.3	-3.7
Normal	10.5	6.4
Bull	15.6	25.3

a. Calculate the expected return of each stock.【二分】

b. Calculate the standard deviation of returns of each stock.【二分】

c. Calculate the covariance and correlation between the two stock.【二分】

(2) Suppose you observe the following situation:

		Return if a State Occurs	
State of Economy	Probability of State	Stock A	Stock B
Bust	.25	-.10	-.30
Normal	.50	.10	.05
Boom	.25	.20	.40

a. Calculate the expected return of each stock.【二分】

b. Assuming the CAPM is true and stock A's beta is greater than stock B's Beta by .25, what is the risk premium?【二分】

四、

Consider the following cash flows of two mutually exclusive projects for Chinese Daily News.

Year	New Sunday Early Edition	New Saturday Late Edition
0	-$1,200	-$2,100
1	600	1,000
2	550	900
3	450	800

a. Based on the payback period rule, which project should be chosen?【二分】

b. Suppose there is no corporate tax and the cash flows above are income before the depreciation. The firm uses a straight-line depreciation method (i.e., equal amounts of depreciation in each year). What is the average accounting return for each of these two projects?【三分】

c. Which project has a greater IRR?【二分】

d. Based on the incremental IRR rule, which project should be chosen?【三分】

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五、

Consider a firm whose debt has a market value of $40 million and whose stock has a market value of $60 million (3 million outstanding shares of stock, each selling for $20 per share). The firm pays a 15-percent rate of interest on its new debt and has a beta of 1.41. The corporate tax rate is 34 percent. (Assume that the SML holds, that the risk premium on the market is 9.5 percent, and that the current Treasury bill rate is 11 percent.) What is this firm's r_{WACC}? 【十分】

六、

Since childhood, John Smith had had one ambition, to open a restaurant that sold alligator meat. He went to business school because he realized that, although he knew 101 ways to cook alligator meat, he didn't have the business skills necessary to run a restaurant. He was extremely focused, with each course at business school, being important to him only to the extent that it could further his dream.

While taking his school's course in entrepreneurship, he began to develop a business plan for his restaurant, which he now called Smith's Alligator Restaurant (SAR). He thought about marketing, he thought about raising capital, he thought about dealing with future employees. He even devoted a great deal of time to designing the physical layout of the restaurant. Of course, his business plan would not be complete without financial projections. After much thought, he came up with the projections shown in the following table.

Financial Projections for John Smith's Shrimp Restaurant

	Year 1	Year 2	Year 3	Year 4	All Future Years
(1) Sales	$300,000	$600,000	$900,000	$1,000,000	$1,000,000
(2) Cash Flows from Operations	-$100,000	-$50,000	+$70,000	+$250,000	+$250,000
(3) Increase in Working Capital	$50,000	$20,000	$10,000	$10,000	0
(4) Net Cash Flows (2)-(3)	-$150,000	-$70,000	$65,000	$240,000	$250,000
Present value of net cash flows in year 1-4 (discounted at 20%)					-$20,255
Present value of terminal value ($250,000/0.2)/(1.20)^4					+$602,816
Present value of restaurant					$582,561
Minus: Cost of building					-$700,000
Net present value of restaurant					-$117,439

The table starts with sales projections, which rise from $300,000 in the first year to a steady state of $1 million a year. Cash Flows from Operations needed to move from line (1) to line (2). After subtracting Working Capital, the table shows Net Cash Flows in line (4). Net Cash Flows are negative initially, as is quite common in start-ups, but they become positive by Year 3. However, the rest of the table presents the unfortunate truth. The cash flows from the restaurant yield a present value of $582,561, assuming a discount rate of 20%. Unfortunately, the cost of the building is greater, at $700,000, implying a negative net present value of -$117,439.

The projections indicate that John's lifelong dream may not come to pass. He cannot expect to raise the capital needed to open his restaurant, and if he did obtain the funding, the restaurant would go under anyway. John checked and rechecked the numbers, hoping vainly to discover either a numerical error or a cost-saving omission that would move his venture from the red to the black. In fact, John saw that, if anything, his forecasts are generous, because a 20% discount rate and an infinitely lived building are on the optimistic side.

It wasn't until John took a course in corporate strategy that he realized the hidden value in his venture. In that course, his instructor repeatedly stated the importance of positioning a firm to take advantage of new opportunities. Although John didn't see the connection at first, he finally realized the implications for SAR. His financial projections were based on expectations. There was a 50% probability that alligator meat would be more popular than he thought, in which case actual cash flows would exceed projections. And, there was a 50% probability that the alligator meat would be less popular, in which case the actual cash flows would fall short of projections.

If the restaurant did poorly, it would probably fold in a few years, because he would not want to keep losing money forever. However, if the restaurant did well, he would be in a position to expand. If alligator meat proved popular in one locale, it would likely prove popular in other locales as well. Thus, he noticed two options, the option to abandon under bad conditions and the option to expand under good conditions.

John reasoned that, as much as he personally liked alligator meat, there were whole regions of the country where consumer resistance would doom SAR. So he developed a strategy of catering only to those regions where alligator meat is somewhat popular already. He forecast that, although he could expand quickly if the first restaurant proved successful, the market would limit him to 30 additional restaurants.

John believes that this expansion will occur about four years from now. He believes that he will need three years of operating the first restaurant to (i) get the initial restaurant running smoothly and (ii) have enough information to place an accurate value on the restaurant. If the first restaurant is successful enough, he will need another year to obtain outside capital. Thus, he will be ready to build the 30 additional restaurants.

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John will value his enterprise, including the option to expand, according to the Black-Scholes model. Assume the standard deviation of the return on the underlying asset to be 0.5, and the continuously compounded interest rate to be 3.5%.

Required:

(1) Calculate the exercise price.【十分】

(2) Calculate the value of the underlying asset.【十分】

(3) Calculate the value of the business including cost of pilot restaurant.【十分】

七、

High Tech Corporation's 2003 financial statements are as follows:

Income Statement
2003

Sales	$1,000
Cost of Goods Sold	500
Gross Profits	$500
Operating Expenses	$300
EBIT	$200

Balance Sheet
Year-Ended 2003

Current Assets	$100	Short-term Debt	$100
Fixed Assets	300	Long-term Debt	150
Other Assets	100	Stock	200
		Retained Earnings	50
	$500		$500

In 2003 High Tech has never paid a dividend. Its debt-equity ratio is 1. This is also the firm's target debt-equity ratio. Unless otherwise stated, the financial planners at High Tech assume that all variables are tied directly to sales and that current relationships are optimal.

Suppose that sales increase by 20% from 2003 to 2004. The planners would then also forecast a 20% increase in costs and all variables.

Required:

(1) Calculate the free cash flows that High Tech expects to create in Year 2004, assuming the tax rate is 33%.【十分】

(2) What financial activities must be done for High Tech in order to keep her target debt-equity ratio. Be sure to show your work.【十分】

d	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4773	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4866	0.4830	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4982	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

N(d) represents areas under the standard normal distribution function. Suppose that $d_1 = 0.24$. This table implies a cumulative probability of 0.5000 + 0.0948 = 0.5948. If d_1 is equal to 0.2452, we must estimate the probability by interpolating between N(0.25) and N(0.24).