考試科目	財務管理	所別	財務管理學系	考試時間	2 月 26 日(日) 第 一 節

Please answer the following question in sequence. They are related to each other.
Please show your calculation.

1.

Chiayi Inc. is considering two mutually exclusive projects, A and B. Cash flows of project A and project B are shown below:

Year	0	1	2	3	4	5	6
Project A	-7,600	1,400	2,000	2,000	2,200	2,200	2,400
Project B	-4,200	1,200	2,300	2,500			

At this moment, Chiayi Inc. uses 8% as the discount rate to evaluate these two projects.

(1) (5 points) Evaluate these two projects with NPV and IRR? (Use linear interpolation to find the approximate IRR value.)

(2) (5 points) Do NPV approach and IRR approach have the same conclusion? Why?

(3) (5 points) Use Replacement Chain Method and Equivalent Annual Annuity (EAA) method to evaluate these two projects. Do these two approaches have the same conclusion as the NPV approach has?

(4) (5 points) Please elaborate on your answers for (2) and (3). Why do sometimes different capital budgeting criteria have different conclusions?

2.

Following the previous question, now Chiayi Inc. will take the project with the highest NPV based on 8% of discount rate. The next question for the company is how to get the money.

Chiayi Inc. has a dividend practice of residual dividend policy. The company's optimal capital structure calls for 40% debt and 60 % common equity. Chiayi Inc. expects to have net income of $12,800.

(1) (5 points) What will be the payout ratio for Chiayi Inc.? How much equity will Chiayi Inc. pay for the project and how much will Chiayi Inc. borrow?

(2) (5 points) What will be the payout ratio for Chiayi Inc., if its expected net income is $4,200?

(3) (5 points) Why does a firm adopt the residual dividend policy? Why is not issuing new common stock to raise capital? What is the premise behind that?

(4) (5 points) Please introduce at least two dividend practices other than the residual dividend policy. Describe their advantages and disadvantages.

備註	試題隨卷繳交

考試科目	財務管理	所別	4701 財務管理學系	考試時間	2 月 26 日(日) 第 一 節

3.

Following the previous questions, Chiayi Inc. needs to borrow some debt. It decides to ask Fuban Bank for a loan. The loan amount is the number you get from question 2 (1). The interest rate is fixed at 8%, and the maturity is 6 years. It will be fully amortized in 6 years. Chiayi Inc. will pay interest and principal at the end of each year. Fuban charges 2% of financing cost. It means that Chiayi Inc. needs to pay 2% of the loan amount to Fuban Bank as the origination fee.

(1) (5 points) What is the annual payment? What are the second year's interest payment and principal payment?

(2) (5 points) What is the effective borrowing cost for Chiayi Inc.?

4.

Please follow previous questions to answer the following question. Chiayi Inc. has a tax rate of 40%. The risk free rate is 5%, and the market risk premium is 6%. Using the CAPM, Chiayi Inc. estimates its cost of equity is currently 12.5%.

(1) (5 points) What is the weighted average cost of capital (WACC) for Chiayi Inc.?

(2) (5 points) Using the WACC you get from 4(1) as the discount rate to evaluate project A and project B in question 1, which project will you choose? Is this the same as your answer in 1 (1)?

(3) (5 points) Is it reasonable that Chiayi Inc. uses 8% as the discount rate in question 1(1)? Why?

(4) (5 points) What is the current beta on Chiayi's common stock? What would be Chiayi's beta be if there is no debt in its capital structure?

5. (20 points) Jeremy Wang, a MBA, wonders why Chiayi Inc. maintains 40% debt and 60 % common equity. He wonders which theory is behind this.

Please describe the following capital structure theories: trade-off, pecking order, signaling and market timing.

6.

(1) (5 points) Why is equity a call option on a firm's asset?

(2) (5 points) Why is a risky debt equivalent to a portfolio which is (a) long a default risk free bond paying D at time T, and (b) short a put option on the firms' assets with strike D and maturity T?

備註	試題隨卷繳交

國立政治大學 101 學年度碩士班招生考試試題

考試科目	統計學	所別	4171 財務管理	考試時間	2月26日(日)第二節

1. (12%) According to survey data, college students carried an average of $3173 credit card debt in 2008. Suppose the probability distribution of the current credit card debts for all college students is known but its mean is $3173 and the standard deviation is $750.

   (1) Find the probability that credit card debt for a randomly selected college student is between $2109 and $3605.

   (2) Let $\bar{x}$ be the mean credit card debt of a random sample of 400 college students. What is the probability that the mean of the current credit card debts for this sample is within $70 of the population mean?

2. (14%) One of the major oil products companies conducted a study recently to estimate the mean gallons of gasoline purchased by customers per visit to a gasoline station. To do this, a random sample of customers was selected with the following data being recorded that show the gallons of gasoline purchased.

8.7	22.4	9.5	13.3	18.9
22.0	14.4	35.7	19.0	24.9
5.7	15.7	8.9	22.5	15.9

   (1) Please construct and interpret a 95 percent confidence interval estimate for the population mean.

   (2) How large should the sample size be if we require in order for a 95% confidence interval for the average gallons of gasoline purchased to have a margin error equal to 0.5 gallon.

3. (12%) A financial analyst is interested in estimating the proportion of publicly traded companies on the Taiwan Stock Exchange that have cash balances that are more than 10 percent of the total assets of the company. A random sample of $n = 100$ companies shows that 13 had cash balances of more than 10 percent of assets.

   (1) Based on this information, develop and interpret a 90 percent confidence interval estimate for the population proportion.

   (2) Test whether the sample information supports the population proportion is greater than 10 percent at the 0.05 level of significance. Use the p-value approach.

4. (12%) An insurance company has determined that each week an average of nine claims are filed in their Atlanta branch. What is the probability that during the next week

   (1) exactly seven claims will be filed?

備註	試題隨卷繳交

考試科目	統計學	所別	4171 財務管理	考試時間	2月26日(日) 第二節

(2) no claims will be filed?

(3) less than four claims will be filed?

5. (50%) A job placement company is interested in developing a model that might be used to explain the variation in starting salaries for college graduates based on the college GPA. The following data were collected through a random sample of the clients with which this company has been associated.

Observation	GPA	Starting salary	GPA×(Starting salary)	GPA^2
1	3.2	35,000	112000	10.24
2	3.4	29,500	100300	11.56
3	2.9	30,000	87000	8.41
4	3.6	36,400	131040	12.96
5	2.8	31,500	88200	7.84
6	2.5	29,000	72500	6.25
7	3.0	33,200	99600	9.00
8	3.6	37,600	135360	12.96
9	2.9	32,000	92800	8.41
10	3.5	36,000	126000	12.25
sum	31.4	330200	1044800	99.8
sum of squares	99.88	10989460000		

(1) Please construct a box and whisker plot for the starting salary of college graduates based on these sample data. Also interpret the resulting plot. (10%)

(2) Test whether the population mean of starting salary for college graduates is greater than 32,000 at the 0.05 level of significance. Use the critical value approach. (7%)

(3) Determine the least squares regression model in starting salaries is explained by GPA. Also interpret the partial regression coefficients. (10%)

(4) If the residual sum of squares is 36760062, determine what percent of the variation in starting salaries is explained by GPA. (5%)

(5) Please construct the analysis of variance table for this regression model. (7%)

(6) Test to determine whether the regression model is statistically significant at the 0.05 level of significance. (6%)

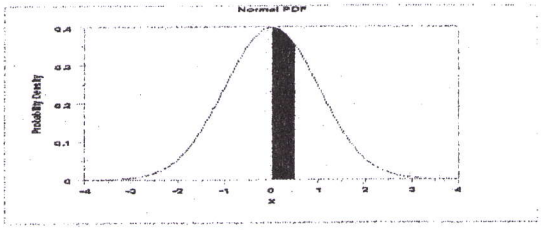
(7) Compute the standard error of the regression model and compare it with the standard deviation of the response variable, starting salary. (5%)

備註	試題隨卷繳交

國立政治大學 101 學年度碩士班招生考試試題

考試科目	統計學	所別	4171 財務管理	考試時間	2月26日(日) 第 二 節

Cumulative Distribution Function of the Standard Normal Distribution



$P(0 \leq x \leq a)$

	Area under the Normal Curve from 0 to X									
X	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	0.0754
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	0.2258	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2518	0.2549
0.7	0.2580	0.2612	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	0.2996	0.3023	0.3051	0.3079	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	0.4430	0.4441
1.6	0.4452	0.4463	0.4474	0.4485	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	0.4700	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4762	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	0.4865	0.4868	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	0.4980	0.4980	0.4981
2.9	0.4981	0.4982	0.4983	0.4983	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

備註	試題隨卷繳交

國立政治大學 101 學年度碩士班招生考試試題

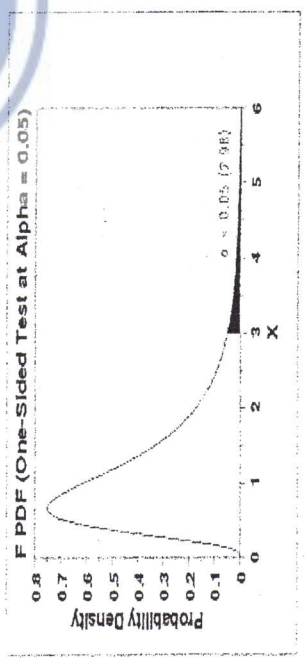
考試科目	統計學	所別	401 財務管理B	考試時間	2月26日(日)第二節

Upper critical values of Student's t distribution with ν degrees of freedom

	Probability of exceeding the critical value					
ν	0.1	0.05	0.025	0.01	0.005	0.001
1	3.078	6.314	12.706	31.821	63.657	318.313
2	1.886	2.920	4.303	6.965	9.925	22.327
3	1.638	2.353	3.182	4.541	5.841	10.215
4	1.533	2.132	2.776	3.747	4.604	7.173
5	1.476	2.015	2.571	3.365	4.032	5.893
6	1.440	1.943	2.447	3.143	3.707	5.208
7	1.415	1.895	2.365	2.998	3.499	4.782
8	1.397	1.860	2.306	2.896	3.355	4.499
9	1.383	1.833	2.262	2.821	3.250	4.296
10	1.372	1.812	2.228	2.764	3.169	4.143
11	1.363	1.796	2.201	2.718	3.106	4.024
12	1.356	1.782	2.179	2.681	3.055	3.929
13	1.350	1.771	2.160	2.650	3.012	3.852
14	1.345	1.761	2.145	2.624	2.977	3.787
15	1.341	1.753	2.131	2.602	2.947	3.733
16	1.337	1.746	2.120	2.583	2.921	3.686
17	1.333	1.740	2.110	2.567	2.898	3.646
18	1.330	1.734	2.101	2.552	2.878	3.610
19	1.328	1.729	2.093	2.539	2.861	3.579
20	1.325	1.725	2.086	2.528	2.845	3.552

Upper Critical Values of the F Distribution

$v_1 \backslash v_2$	1	2	3	4	5	6	7	8	9	10
1	161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.882	240.543	241.882
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371	19.385	19.396
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.786
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438	3.388	3.347
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948	2.896	2.854
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849	2.796	2.753
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767	2.714	2.671



$F_{v_1=10,v_2=10,\alpha=0.05}$

備註	試題隨卷繳交

國立政治大學 101 學年度碩士班招生考試試題

考試科目	微積分	所別	財務管理系 4171	考試時間	2月26日(日) 第 二 節

1. (10%) Evaluate $\int_0^1 \int_0^1 xye^{x^2+y^2}\,dy\,dx$.

2. (20%) Determine whether the following sequence converges or diverges. If a_n converges, please find $\lim_{n\to\infty} a_n$.

(a) (5%) $a_n = \frac{4n^2+2}{n^2+3n-1}$

(b) (5%) $a_n = \left(1+\frac{2}{n}\right)^{n/2}$

(c) (10%) $a_1 = 1$, $a_{n+1} = 1 + \frac{1}{2}a_n$

3. (14%) Please find the sum of the series:

(a) (7%) $\sum_{n=0}^{\infty}\left[\left(\frac{2}{3}\right)^n - \frac{1}{(n+1)(n+2)}\right]$

(b) (7%) $\sum_{n=0}^{\infty}\frac{2^n}{3^n n!}$

4. (12%) Please evaluate the following integrals:

(a) (6%) $\int_2^{\infty}\frac{\ln x}{x^2}dx$

(b) (6%) $\int_0^2 x\left(x^2+1\right)^5 dx$

5. (24%) Please evaluate the following integrals:

(a) (8%) $\int t^5 \ln\left(t^7\right) dt$

(b) (8%) $\int \frac{x+1}{(x-3)^2}dx$

(c) (8%) $\int \frac{-1}{x(\ln x)^2}dx$

6. (10%) Define $y = \left(\frac{x+1}{x-1}\right)^3$, please find $\frac{dy}{dx}$.

7. (10%) Define $y = \left(7x^2+3x-1\right)^{-3/2}$, please find dy.

備註	試題隨卷繳交