UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For The Following Qualification:-

B.Sc.

ES2224: Economics II

COURSE CODE	:	**ENVS2224**
UNIT VALUE	:	**0.50**
DATE	:	**10-MAY-04**
TIME	:	**10.00**
TIME ALLOWED	:	**3 Hours**

04-C0422-3-60

ENVS2224 Economics II

Answer FIVE questions. Questions are worth 20 marks each.

1.
(1) What is the Gateway Review Process in public construction procurement?
(2) How does the Gateway Review work?
(3) What are the main benefits and costs of this policy?
(4) Comment on this policy and find ways to improve it.

2.
Suppose you are an in-house project manager for a local council. Now the councillor considers initiating a new school PFI project. Please follow the appraisal and evaluation cycle recommended in the Treasury's Green Book to illustrate (1) the key stages of the process, (2) key activities that should be done at each stage and (3) the way that the quality of appraisal at each stage can be improved.

3. Please comment on the following two statements:
(1) The great merit of IRR rule is that one does not have to think about what is an appropriate discount rate.
(2) Your CEO thinks that, now that the bank is willing to lend our company the money that we need for the project at 10%, 10% should be a good indicator for the opportunity cost of capital for this capital.
(3) The dollar received the day after tomorrow is not necessarily worth less than the dollar received tomorrow.

4.
(1) Why may the property market be more prone to form a bubble?
(2) Please illustrate two good ways to measure the intrinsic value of property markets.
(3) A freehold interest in a city centre shop recently was let at a rent of £10,000 for very long lease subject to annual review. Assume investors' target internal rate of return is 20%, and rental growth is expected to be 10% per annum. Please use the discounted cash flow approach to estimate the market value of this shop (state your assumption, if any)?

TURN OVER

5. A company is making an assessment of the following four projects.

PROJECT	Cash Flows (1000 £)			
	year 0	year 1	year 2	year 3
A	-10	4	3	5
B	-5	2	3	2
C	-15	5	2	15
D	-3,000	2	1	0

(a) Given that you wish to use the payback rule with a cutoff period of two years, which projects would you accept?
(b) If the opportunity cost of capital is 10%, which projects have positive NPVs?
(c) Payback gives too much weight to cash flows that occur after the cutoff date. True or false. Explain.
(d) If a firm uses a single cutoff period for all projects, it is likely to accept too many short-lived projects. True or false. Explain

6. Alan Bissell, market analyst for City Sound Mart, is analyzing the relation between heavy metal CD sales and the size of the teenage population. He gathers data from six sales districts. Alan's dependent variable is annual heavy metal CD sales (in $1,000,000's), and his independent variable is teenage population (in 1,000's). Regression analysis of the data yielded the following tables.

	Coefficients	Standard Error	*t* Statistic	*P*-value
Intercept	-0.14156	0.292143	-0.48455	0.653331
x	0.105195	0.013231	7.950352	0.001356

Source	df	SS	MS	F
Regression	1	3.550325	3.550325	63.20809
Residual	4	0.224675	0.056169	
Total	5	3.775		

Se = 0.237
r^2 = 0.940483

(1) What is Alan's regression model?
(2) What is Alan's correlation coefficient?.
(3) What is Alan's sample size ?
(4) Using $\alpha = 0.05$, should Alan accept H_0: $\beta_1 = 0$?
(5) For a sales district with 20,000 teenagers, Alan's model predicts annual CD sales of how much?

CONTINUED

7. Can the consumption of water in a city be predicted by temperature? The following data represent a sample of a day's water consumption and the high temperature for that day.

Water use (x) (millions of gallons)	Temperature(y) (degrees Fahrenheit)
219	103
56	39
107	77
129	78
68	50
184	96
150	90
112	75

To simplify your calculation, the following summations are given.

$\Sigma x = 608$ $\Sigma x^2 = 49{,}584$

$\Sigma y = 1{,}025$ $\Sigma y^2 = 152{,}711$

$\Sigma xy = 86{,}006$

(1) Develop a least squares regression line to predict the amount of water used in a day in a city by the high temperature for that day.

(2) What would be the predicted water usage for a temperature of 100°?

(3) Evaluate the regression model by calculating s_e, by calculating r^2, and by testing the slope. Let $\alpha = 0.01$.

8. (1) What are the fundamental problems in the construction industry?

(2) What are the solutions to these problems proposed in the Egan report?

END OF PAPER

$$NPV = C_0 + \sum \frac{C_t}{(1+r)^t}$$

$$\mathrm{PV}_t = \frac{C}{r} - (\frac{C}{r})\frac{1}{(1+r)^t} \qquad \mathrm{PV}_t = (\frac{C}{r})\frac{1}{(1+r)^t}$$

$$\mathrm{PV} = \frac{C_1}{r-g}$$

$$b_1 = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sum (x-\bar{x})^2} = \frac{\sum xy - n\bar{x}\bar{y}}{\sum x^2 - n\bar{x}^2} = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sum x^2 - \frac{(\sum x)^2}{n}}$$

$$b_0 = \bar{y} - b_1\bar{x} = \frac{\sum y}{n} - b_1\frac{\sum x}{n}$$

$$s_e = \sqrt{\frac{SSE}{n-2}}$$

$$SSE = \sum (y-\hat{y})^2 = \sum y^2 - b_0\sum y - b_1\sum xy$$

$$r^2 = 1 - \frac{SSE}{\sum y^2 - \frac{(\sum y)^2}{n}} \qquad 0 \le r^2 \le 1$$

$$t = \frac{b_1 - \beta_1}{s_b}$$

$$s_b = \frac{s_e}{\sqrt{SS_{xx}}} \qquad s_e = \sqrt{\frac{SSE}{n-2}}$$

$$SS_{xx} = \sum x^2 - \frac{(\sum x)^2}{n}$$

PRESENT VALUE TABLES

Discount factors: Present value of $1 to be received after *t* years = $1/(1 + r)^t$.

Number of Years	Interest Rate per Year 1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870
2	.980	.961	.943	.925	.907	.890	.873	.857	.842	.826	.812	.797	.783	.769	.756
3	.971	.942	.915	.889	.864	.840	.816	.794	.772	.751	.731	.712	.693	.675	.658
4	.961	.924	.888	.855	.823	.792	.763	.735	.708	.683	.659	.636	.613	.592	.572
5	.951	.906	.863	.822	.784	.747	.713	.681	.650	.621	.593	.567	.543	.519	.497
6	.942	.888	.837	.790	.746	.705	.666	.630	.596	.564	.535	.507	.480	.456	.432
7	.933	.871	.813	.760	.711	.665	.623	.583	.547	.513	.482	.452	.425	.400	.376
8	.923	.853	.789	.731	.677	.627	.582	.540	.502	.467	.434	.404	.376	.351	.327
9	.914	.837	.766	.703	.645	.592	.544	.500	.460	.424	.391	.361	.333	.308	.284
10	.905	.820	.744	.676	.614	.558	.508	.463	.422	.386	.352	.322	.295	.270	.247
11	.896	.804	.722	.650	.585	.527	.475	.429	.388	.350	.317	.287	.261	.237	.215
12	.887	.788	.701	.625	.557	.497	.444	.397	.356	.319	.286	.257	.231	.208	.187
13	.879	.773	.681	.601	.530	.469	.415	.368	.326	.290	.258	.229	.204	.182	.163
14	.870	.758	.661	.577	.505	.442	.388	.340	.299	.263	.232	.205	.181	.160	.141
15	.861	.743	.642	.555	.481	.417	.362	.315	.275	.239	.209	.183	.160	.140	.123
16	.853	.728	.623	.534	.458	.394	.339	.292	.252	.218	.188	.163	.141	.123	.107
17	.844	.714	.605	.513	.436	.371	.317	.270	.231	.198	.170	.146	.125	.108	.093
18	.836	.700	.587	.494	.416	.350	.296	.250	.212	.180	.153	.130	.111	.095	.081
19	.828	.686	.570	.475	.396	.331	.277	.232	.194	.164	.138	.116	.098	.083	.070
20	.820	.673	.554	.456	.377	.312	.258	.215	.178	.149	.124	.104	.087	.073	.061
25	.780	.610	.478	.375	.295	.233	.184	.146	.116	.092	.074	.059	.047	.038	.030
30	.742	.552	.412	.308	.231	.174	.131	.099	.075	.057	.044	.033	.026	.020	.015

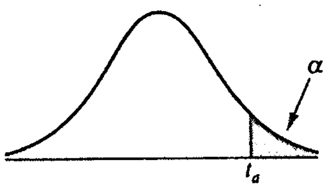
Note: For example, if the interest rate is 10 percent per year, the present value of $1 received at year 5 is $.621.

Annuity table: Present value of $1 *per year* for each of t years = $1/r - 1/[r(1+r)^t]$.

Number of Years	Interest Rate per Year 1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909	.901	.893	.885	.877	.870
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690	1.668	1.647	1.626
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402	2.361	2.322	2.283
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037	2.974	2.914	2.855
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605	3.517	3.433	3.352
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	4.231	4.111	3.998	3.889	3.784
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	4.564	4.423	4.288	4.160
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968	4.799	4.639	4.487
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328	5.132	4.946	4.772
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650	5.426	5.216	5.019
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938	5.687	5.453	5.234
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194	5.918	5.660	5.421
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424	6.122	5.842	5.583
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628	6.302	6.002	5.724
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606	7.191	6.811	6.462	6.142	5.847
16	14.72	13.58	12.56	11.65	10.84	10.11	9.447	8.851	8.313	7.824	7.379	6.974	6.604	6.265	5.954
17	15.56	14.29	13.17	12.17	11.27	10.48	9.763	9.122	8.544	8.022	7.549	7.120	6.729	6.373	6.047
18	16.40	14.99	13.75	12.66	11.69	10.83	10.06	9.372	8.756	8.201	7.702	7.250	6.840	6.467	6.128
19	17.23	15.68	14.32	13.13	12.09	11.16	10.34	9.604	8.950	8.365	7.839	7.366	6.938	6.550	6.198
20	18.05	16.35	14.88	13.59	12.46	11.47	10.59	9.818	9.129	8.514	7.963	7.469	7.025	6.623	6.259
25	22.02	19.52	17.41	15.62	14.09	12.78	11.65	10.67	9.823	9.077	8.422	7.843	7.330	6.873	6.464
30	25.81	22.40	19.60	17.29	15.37	13.76	12.41	11.26	10.27	9.427	8.694	8.055	7.496	7.003	6.566

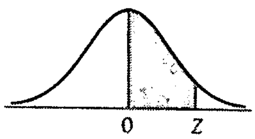
Note: For example, if the interest rate is 10 percent per year, the present value of $1 received in each of the next 5 years is $3.791.

Critical Values from the t Distribution



Values of α for one-tailed test and $\alpha/2$ for two-tailed test						
df	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$	$t_{.001}$
1	3.078	6.314	12.706	31.821	63.656	318.289
2	1.886	2.920	4.303	6.965	9.925	22.328
3	1.638	2.353	3.182	4.541	5.841	10.214
4	1.533	2.132	2.776	3.747	4.604	7.173
5	1.476	2.015	2.571	3.365	4.032	5.894
6	1.440	1.943	2.447	3.143	3.707	5.208
7	1.415	1.895	2.365	2.998	3.499	4.785
8	1.397	1.860	2.306	2.896	3.355	4.501
9	1.383	1.833	2.262	2.821	3.250	4.297
10	1.372	1.812	2.228	2.764	3.169	4.144
11	1.363	1.796	2.201	2.718	3.106	4.025
12	1.356	1.782	2.179	2.681	3.055	3.930
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
21	1.323	1.721	2.080	2.518	2.831	3.527
22	1.321	1.717	2.074	2.508	2.819	3.505
23	1.319	1.714	2.069	2.500	2.807	3.485
24	1.318	1.711	2.064	2.492	2.797	3.467
25	1.316	1.708	2.060	2.485	2.787	3.450
26	1.315	1.706	2.056	2.479	2.779	3.435
27	1.314	1.703	2.052	2.473	2.771	3.421
28	1.313	1.701	2.048	2.467	2.763	3.408
29	1.311	1.699	2.045	2.462	2.756	3.396
30	1.310	1.697	2.042	2.457	2.750	3.385
40	1.303	1.684	2.021	2.423	2.704	3.307
50	1.299	1.676	2.009	2.403	2.678	3.261
60	1.296	1.671	2.000	2.390	2.660	3.232
70	1.294	1.667	1.994	2.381	2.648	3.211
80	1.292	1.664	1.990	2.374	2.639	3.195
90	1.291	1.662	1.987	2.368	2.632	3.183
100	1.290	1.660	1.984	2.364	2.626	3.174
150	1.287	1.655	1.976	2.351	2.609	3.145
200	1.286	1.653	1.972	2.345	2.601	3.131
∞	1.282	1.645	1.960	2.326	2.576	3.090

Areas of the Standard Normal Distribution



The entries in this table are the probabilities that a standard normal random variable is between 0 and Z (the shaded area).

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990
3.1	.4990	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	.4993	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	.4995	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.5	.4998									
4.0	.49997									
4.5	.499997									
5.0	.4999997									
6.0	.499999999									