

(橫書式) 國立東華大學

學年度碩士班招生考試試題

科目：統計學^{八十八}(國企可)

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Rules for This Examination: (1) Answer each question in detail; (2) Provide necessary explanations and calculations in your answers or you will receive zero point.

[Question 1]: Please choose the correct answer for each of following questions: (15%)

- (1) A nonparametric test for the equivalence of two populations would be used instead of a parametric test for the equivalence of the population parameters if (a) the samples are not independent; (b) the parametric test is always used in this situation; (c) interval data are available; (d) no information about the population is available.
- (2) Chi-square tests may be used for testing hypotheses concerning: (a) goodness-of-fit; (b) contingency; (c) proportions; (d) all of the above.
- (3) The level of significance in hypothesis testing (I) is the maximum allowable probability of Type I error; (II) is the maximum allowable probability of Type II error; (III) is the same as p-value; (IV) is the probability of accepting a false null hypothesis; (V) is the probability of rejecting a true null hypothesis. Which of the above statements is (are) true: (a) I only; (b) II and IV; (c) I and III; (d) I and V.
- (4) Which of followings has a chi-square distribution? (a) $(n-1)\sigma^2/S^2$; (b) $(n-2)\sigma^2/S^2$; (c) $(n-1)S^2/\sigma^2$; (d) $(n-1)S/\sigma$.
- (5) When p-value is used for hypothesis testing the rejection of null hypothesis if (a) p-value $< \alpha$; (b) p-value $> \alpha$; (c) p-value = α ; (d) none of the above answers is true.

[Question 2]: Probability distributions of X and of Y are given in the tables below. If $P(X=0|Y=0) = 0.5$, please calculate the following answers: (1) the joint probability distribution of X and Y ; (2) the covariance σ_{xy} ; and (3) the coefficient of correlation ρ_{xy} . (15%)

x	0	500	y	0	1000
$P(x)$	0.6	0.4	$P(y)$	0.7	0.3

[Question 3]: The following table contains data for five randomly selected consumers of Carrefour Hualien Store. X_i represents probability of the i consumer's first purchase of Brand-Q detergent at the store. Y_i represents probability of the same consumer's second purchase of Brand-Q detergent at the store. For significant level $\alpha = 0.05$, please determine (1) the simple regression model $Y = \beta_0 + \beta_1 X_i$; (2) if the intercept β_0 is greater than zero; (3) if the regression coefficient β_1 is greater than zero; (4) the confidence interval for β_0 ; and (5) the confidence interval for β_1 . (30%)

	1	2	3	4	5
X	22%	25%	26%	26%	31%
Y	26%	24%	25%	31%	29%

[Question 4]: At the COMP USA Store, nine computer buyers were randomly selected for interviews. Each interviewee was asked for his/her preferences among five computer brands (Acer, Apple, IBM, Tandy, and Twinhead) by ranking them from 1 to 5. Please determine whether these five computer brands were treated equally at the significant level of 0.05. (25%)

Buyer \ Brands	Acer	Apple	IBM	Tandy	Twinhead
1	3	2	5	4	1
2	2	1	3	5	4
3	1	3	4	5	2
4	3	1	4	5	2
5	3	1	2	5	4
6	3	2	4	5	1
7	5	3	4	2	1
8	2	3	4	5	1
9	5	2	3	4	1

[Question 5]: A study was completed on equal employment opportunities at Silicon Graphics International (SGI) in Mountain View, California, U.S.A. in 1998. Data were collected for the log of beginning salary, year of education, sex, years of previous work experience, minority status (race), and age in years. In the multiple linear regression model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$, variables sex and minority are represented by control variables, that is, variables coded as 0 or 1.

Please use the provided statistics tables to answer following questions. (You should provide your reasoning.) (1) Would you assign more importance to education as a predictor of salary than to previous work experience when each variable is used alone to predict beginning salary? (2) What was the proportion of variability of dependent variable Y explained by independent variables X_1 , X_2 , X_3 , X_4 and X_5 ? (3) If the R Square = 0.66578 and Adjusted R Square = 0.60017 when added an additional independent variable (X_6) to the model, does X_6 help better explaining Y? (15%)

The Correlation Matrix Table:

Correlation:

	LOGBEG	EDLEVEL	SEX	WORK	MINORITY	AGE
LOGBEG	1.000	0.686	-0.548	0.040	-0.173	-0.048
EDLEVEL	0.686	1.000	-0.356	-0.252	-0.133	-0.281
SEX	-0.548	-0.356	1.000	-0.165	-0.076	-0.052
WORK	0.040	-0.252	-0.165	1.000	0.145	0.804
MINORITY	-0.173	-0.133	-0.076	0.145	1.000	0.111
AGE	-0.048	-0.281	0.052	0.804	0.111	1.000

Statistics for the Equation and Analysis-of-Variance Table:

Multiple R	0.78420
R Square	0.61498
Adjusted R Square	0.61086
Standard Error	0.09559

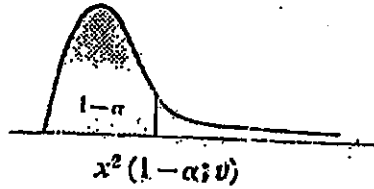
Analysis of Variance

	DF	Sum of Square	Mean Square
Regression	5	6.83039	1.36608
Residual	468	4.27638	0.00914
F =	149.50125	Signif F = 0.000043	

Statistics for Variables in the Equation Table:

Variable	Variables in the Equation				
	B	SE B	Beta	T	Sig T
AGE	0.01015	6.6132E-04	0.078106	1.535	0.125400
SEX	-0.103576	0.010318	-0.336987	-10.038	0.000033
MINORITY	-0.052366	0.010837	-0.141573	-4.832	0.000037
EDLEVEL	0.031443	0.001748	0.591951	17.988	0.000049
WORK	0.001608	9.2407E-04	0.091428	1.740	0.082600
(Constant)	3.385300	0.033233		101.866	0.000028

χ^2 分配表



v	1 - α									
	.005	.010	.025	.050	.100	.900	.950	.975	.990	.995
1	0.00433	0.0157	0.03982	0.07393	0.158	2.71	3.84	5.02	6.63	7.88
2	0.0100	0.0201	0.0506	0.103	0.211	4.61	5.99	7.38	9.21	10.60
3	0.072	0.115	0.216	0.352	0.584	6.25	7.81	9.35	11.34	12.84
4	0.207	0.297	0.484	0.711	1.064	7.78	9.49	11.14	13.28	14.86
5	0.412	0.554	0.831	1.145	1.61	9.24	11.07	12.83	15.09	16.75
6	0.676	0.872	1.24	1.64	2.20	10.64	12.59	14.45	16.81	18.55
7	0.989	1.24	1.69	2.17	2.83	12.02	14.07	16.01	18.48	20.28
8	1.34	1.65	2.18	2.73	3.49	13.36	15.51	17.53	20.09	21.96
9	1.73	2.09	2.70	3.33	4.17	14.68	16.92	19.02	21.67	23.59
10	2.16	2.56	3.25	3.94	4.87	15.99	18.31	20.48	23.21	25.19
11	2.60	3.05	3.82	4.57	5.58	17.28	19.68	21.92	24.73	26.76
12	3.07	3.57	4.40	5.23	6.30	18.55	21.03	23.34	26.22	28.30
13	3.57	4.11	5.01	5.89	7.04	19.81	22.36	24.74	27.69	29.82
14	4.07	4.66	5.63	6.57	7.79	21.06	23.68	26.12	29.14	31.32
15	4.60	5.23	6.26	7.26	8.55	22.31	25.00	27.49	30.58	32.80
16	5.14	5.81	6.91	7.96	9.31	23.54	26.30	28.85	32.00	34.27
17	5.70	6.41	7.56	8.67	10.09	24.77	27.59	30.19	33.41	35.72
18	6.26	7.01	8.23	9.39	10.86	25.99	28.87	31.53	34.81	37.16
19	6.84	7.63	8.91	10.12	11.65	27.20	30.14	32.85	36.19	38.58
20	7.43	8.26	9.59	10.85	12.44	28.41	31.41	34.17	37.57	40.00
21	8.03	8.90	10.28	11.59	13.24	29.62	32.67	35.48	38.93	41.40
22	8.64	9.54	10.98	12.34	14.04	30.81	33.92	36.78	40.29	42.80
23	9.26	10.20	11.69	13.09	14.85	32.01	35.17	38.08	41.64	44.18
24	9.89	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98	45.56
25	10.52	11.52	13.12	14.61	16.47	34.38	37.65	40.65	44.31	46.93
26	11.16	12.20	13.84	15.38	17.29	35.56	38.89	41.92	45.64	48.29
27	11.81	12.86	14.57	16.15	18.11	36.74	40.11	43.19	46.96	49.64
28	12.46	13.56	15.31	16.93	18.94	37.92	41.34	44.46	48.28	50.99
29	13.12	14.26	16.05	17.71	19.77	39.09	42.56	45.72	49.59	52.34
30	13.79	14.95	16.79	18.49	20.60	40.26	43.77	46.98	50.89	53.67
40	20.71	22.16	24.43	26.51	29.05	51.81	55.76	59.34	63.69	66.77
50	27.99	29.71	32.36	34.76	37.69	63.17	67.50	71.42	76.15	79.49
60	35.53	37.48	40.48	43.19	46.46	74.40	79.08	83.30	88.38	91.95
70	43.28	45.44	48.76	51.74	55.33	85.53	90.53	95.02	100.4	104.2
80	51.17	53.54	57.15	60.39	64.28	96.58	101.9	106.6	112.3	116.3
90	59.20	61.75	65.65	69.13	73.29	107.6	113.1	118.1	124.1	128.3
100	67.33	70.06	74.22	77.93	82.36	118.5	124.3	129.6	135.8	140.2

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科目：統計學 (國企所)

共 6 頁 第 5

t 分配表

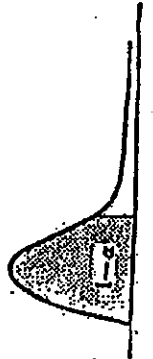


v	1 - α					
	.90	.95	.975	.99	.995	.9995
1	3.078	6.314	12.706	31.821	63.657	316.619
2	1.886	2.920	4.303	6.965	9.925	31.598
3	1.638	2.353	3.182	4.541	5.841	12.924
4	1.533	2.132	2.776	3.747	4.604	8.610
5	1.476	2.015	2.571	3.365	4.032	6.869
6	1.440	1.943	2.447	3.143	3.707	5.959
7	1.415	1.895	2.365	2.998	3.499	5.408
8	1.397	1.860	2.306	2.896	3.355	5.041
9	1.383	1.833	2.262	2.821	3.250	4.781
10	1.372	1.812	2.228	2.764	3.169	4.587
11	1.363	1.796	2.201	2.718	3.106	4.437
12	1.356	1.782	2.179	2.681	3.055	4.318
13	1.350	1.771	2.160	2.650	3.012	4.221
14	1.345	1.761	2.145	2.624	2.977	4.140
15	1.341	1.753	2.131	2.602	2.947	4.073
16	1.337	1.746	2.120	2.583	2.921	4.015
17	1.333	1.740	2.110	2.567	2.898	3.965
18	1.330	1.734	2.101	2.552	2.878	3.922
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850
21	1.323	1.721	2.080	2.518	2.831	3.819
22	1.321	1.717	2.074	2.508	2.819	3.792
23	1.319	1.714	2.069	2.500	2.807	3.767
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690
28	1.313	1.701	2.048	2.467	2.763	3.674
29	1.311	1.699	2.045	2.462	2.756	3.659
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.291

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科目: 統計學(國企所)

F 分配表



$F(1-\alpha; v_1, v_2)$

$1-\alpha=0.95$

	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	∞
1	161.4	190.5	215.7	224.6	230.2	234.0	236.8	239.9	240.5	241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.68	8.64	8.62	8.59	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.98	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	6.51	5.79	5.41	5.19	5.05	4.95	4.88	4.83	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.48	4.43	4.40	4.36
6	5.99	5.14	4.70	4.43	4.30	4.23	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8	5.32	4.46	4.07	3.84	3.69	3.59	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10	4.90	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.59	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.94	2.89	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.92	2.85	2.80	2.76	2.69	2.62	2.54	2.51	2.47	2.43	2.39	2.35	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.45	2.42	2.38	2.34	2.30	2.25	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.37	2.34	2.30	2.26	2.22	2.17	2.13
15	4.51	3.65	3.25	3.02	2.87	2.76	2.67	2.61	2.55	2.51	2.44	2.37	2.28	2.25	2.21	2.17	2.13	2.08	2.04
16	4.49	3.63	3.23	2.99	2.84	2.73	2.64	2.58	2.52	2.48	2.41	2.34	2.25	2.22	2.18	2.14	2.10	2.05	2.01
17	4.45	3.59	3.19	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.22	2.19	2.15	2.11	2.07	2.01	1.96
18	4.41	3.55	3.15	2.92	2.77	2.66	2.57	2.51	2.45	2.41	2.34	2.27	2.18	2.15	2.11	2.07	2.03	1.97	1.92
19	4.38	3.52	3.12	2.89	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.24	2.15	2.12	2.07	2.03	1.99	1.93	1.88
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.21	2.12	2.09	2.04	1.99	1.95	1.90	1.84
21	4.32	3.47	3.07	2.84	2.69	2.57	2.48	2.42	2.36	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.02	1.98	1.94	1.89	1.84	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.38	2.32	2.28	2.21	2.13	2.05	2.00	1.96	1.91	1.87	1.81	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.26	2.19	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.17	2.09	2.01	1.96	1.92	1.87	1.83	1.77	1.71
26	4.23	3.37	2.98	2.74	2.58	2.47	2.38	2.32	2.26	2.22	2.15	2.07	1.99	1.94	1.90	1.85	1.80	1.75	1.69
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.21	2.14	2.06	1.97	1.92	1.88	1.83	1.79	1.73	1.67
28	4.20	3.34	2.95	2.71	2.55	2.44	2.35	2.29	2.23	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
29	4.19	3.33	2.93	2.70	2.54	2.43	2.34	2.28	2.22	2.18	2.11	2.03	1.94	1.90	1.85	1.81	1.75	1.69	1.64
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.17	2.10	2.02	1.93	1.89	1.84	1.79	1.74	1.68	1.62
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.19	2.13	2.09	2.02	1.94	1.85	1.80	1.76	1.69	1.64	1.58	1.51
60	4.03	3.15	2.76	2.53	2.37	2.26	2.17	2.11	2.05	2.01	1.94	1.86	1.75	1.70	1.65	1.59	1.53	1.47	1.39
120	3.92	3.07	2.68	2.45	2.29	2.17	2.08	2.02	1.96	1.91	1.84	1.75	1.65	1.61	1.55	1.50	1.43	1.35	1.25
∞	3.81	3.00	2.60	2.37	2.21	2.10	2.01	1.95	1.89	1.84	1.77	1.67	1.57	1.52	1.46	1.39	1.32	1.24	1.14

1 (15%) Evaluate the limit (if it exists) of the following questions.

(a) $\lim_{x \rightarrow +\infty} (\sqrt{x^2 + a^2} - x)$ (b) $\lim_{x \rightarrow a} \frac{x^p - a^p}{x^q - a^q}, a > 0$ (c) $\lim_{x \rightarrow 0} (1+x)^{1/x}$

2 (15%) Evaluate the following integrals:

(a) $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$ (b) $\int x^3 (\ln x)^2 dx$ (c) $\int_0^4 \int_{-\sqrt{y}}^{\sqrt{y}} \sqrt{1+x^2} dx$

3 (5%) Given $F(x) = \int_0^x f(x) dx$, show $\int_0^x (1 - F(x)) dx = \int_0^x xf(x) dx$.

4 (5%) Present the result of $\frac{d}{da} \int_0^a (a-x)f(x) dx$ in terms of $F(x)$ where $F(x) = \int_0^x f(x) dx$.

5 (10%) Show directly from the definition that $\lim_{x \rightarrow 1} \frac{x}{x+1} = \frac{1}{2}$. (Hint: Definition of Limit -- Given a function f and numbers a and L , we say that $f(x)$ tends to L as a limit as x tends to a if for each positive number ϵ there is positive number δ such that $f(x)$ is defined and $|f(x) - L| < \epsilon$ whenever $0 < |x - a| < \delta$.)

6 (10%) The region bounded by $f(x) = 1/x$, the x axis, and the line $x = 1$, and situated to the right of $x = 1$, is revolved about the x axis. Evaluate the improper integral and assign a value to the volume of the solid generated.

7 (10%) Use Simpson's Rule with $2n = 4$ to compute the approximate value for $\int_1^2 \frac{dx}{x}$. Keep two decimal places and round off to one less.

8 (10%) For what values of p and q does the series $\sum_{n=1}^{\infty} \frac{(\ln n)^p}{n^q}$ converge?

9 (10%) Use Taylor's Theorem to compute $(1.1)^{1/5}$ to an accuracy of four decimal places. (Hint: Taylor's Theorem with Derivative Form of Remainder -- Suppose that $f, f', f^{(2)}, \dots, f^{(n)}$ are all continuous on some interval containing a and b . Then there is a number ϵ between a and b such that $f(b) = f(a) + f'(a)(b-a)/1! + \dots + f^{(n)}(a)(b-a)^n/n! + f^{(n+1)}(\epsilon)(b-a)^{n+1}/(n+1)!$. That is, the remainder R_n is given by the formula $R_n = f^{(n+1)}(\epsilon)(b-a)^{n+1}/(n+1)!$.)

10 (10%) Find the critical values of $f(x,y) = x^2 + y^2$, subject to the condition that $x^3 + y^3 - 6xy = 0$.

Write your answers on the answer sheet

I. In questions 1-15, each sentence has a word or phrase underlined. Below each sentence are five choices marked A, B, C, D and E. Choose *the answer that is closest in meaning to the underlined word or phrase.* 37.5%

1. Peter vowed not to take another drink as long as he lived.
(A) agreed (B) refused (C) decided (D) promised (E) praised
2. We are going to have to do something drastic about the situation.
(A) ordinary (B) weird (C) extreme (D) disparaging (E) dire
3. He was summoned to appear in traffic court.
(A) invited (B) begged (C) reckoned (D) dismissed (E) ordered
4. Helen's natural beauty was enhanced by her personality.
(A) contrasted (B) mocked (C) increased (D) entangled (E) mingled
5. The committee considered this project feasible.
(A) practicable (B) difficult (C) steadfast (D) farfetched (E) frail
6. The Mississippi River has always played an indispensable role in trade and commerce through the nation's heartland.
(A) a developmental (B) a thorough (C) an elevated (D) an essential (E) a positive
7. The French explorer Sieur de La Salle laid claim to territory in the New World, designating it Louisiana after the French monarch King Louis XVI.
(A) transferring (B) acquiring (C) unifying (D) labeling (E) conquering
8. Bacteria can be both detrimental and helpful to humans, depending on the specific type and effect.
(A) productive (B) useful (C) harmful (D) fatal (E) instrumental
9. Encumbered by our baggage, we almost missed the bus.
(A) Decimated (B) Discerned (C) Burdened (D) Abominated (E) Damaged
10. Animals were first domesticated as a source of food and later as a source of clothing and transportation.
(A) raised (B) brought (C) found (D) demolished (E) expanded
11. The facts were not germane to the argument.
(A) crucial (B) pertinent (C) necessary (D) useless (E) perplexing
12. As an adolescent he had an intense but ephemeral passion for collecting postcards.
(A) incredible (B) understandable (C) superfluous (D) unique (E) transient
13. The anthology comprised the best-known works of about twenty Victorian poets.
(A) consisted of (B) complemented (C) excluded (D) investigated (E) elucidated
14. Mother found the waterbed conducive to a restful sleep.
(A) helpful (B) obstructive (C) suitable (D) delightful (E) responsible
15. The rules of the private school circumscribed the daily activities of the students.
(A) corroborated (B) confirmed (C) confined (D) revoked (E) invoked

II. Questions 16-30 contain sentences that are incorrect in some way. Choose *the one underlined part that is wrong.* 37.5%

16. Herman Melville completed a work calling "The Isle of the Cross," a manuscript that was only recently found.
A B C
D E
17. Instead of you and I, this year Albert and his date are going to be in charge of plans for the
A B C D E

picnic.

18. The Canadian skier whom we saw on the train are staying in that condominium.
A B C D E
19. Although she had no money, she determined to go to college by working part-time.
A B C D E
20. Lasers are of great value in areas such like communications, industry, medicine, and scientific research.
A B C D E
21. Seahorses spend much of their time clung with their tails to underwater plants.
A B C D E
22. Success in fencing requires not only skill and balance but also mental alertness and concentrate.
A B C D E
23. Since even the gentlest pet may bit when it is in pain, it is wise to muzzle an injured animal by wrapping a soft cloth around its jaws.
A B C D E
24. The Johnston family have been living in a tiny apartment since they move to town last September.
A B C D E
25. Toward the front of the cortex is the motor area send nerve messages to the muscles.
A B C D E
26. Only after local residents became sick and publicly voiced their displeasure the chemical company began to clean up its dump sites.
A B C D E
27. The worse winter of all for the settlers at Jamestown was that of 1601, when several in their party died.
A B C D E
28. Dr. Smith took a position at the University of Michigan, which he taught for three years.
A B C D E
29. The long-term affects of the American Civil War, which split families and friends apart, are still being felt in the twentieth century.
A B C D E
30. The company is very happy with the architecture who designed this building.
A B C D E

III. The remaining questions are based on the following reading passage, which consists of six paragraphs. 25%

SPOKEN CORPUS COMES TO LIFE

- 1 The compiling of dictionaries has been historically the provenance of studious professorial types who love to pore over weighty volumes and make pronouncements on the finer nuances of meaning. They were probably good at crosswords and definitely knew a lot of words, but the image was always dry and dusty. The latest technology is revolutionizing the content of dictionaries and the way they are put together.

- 2 For the first time, dictionary publishers are incorporating real, spoken English into their data. It gives lexicographers (people who write dictionaries) access to a more vibrant, up-to-date vernacular language which has never really been studied before. In one project, 150 volunteers each agreed to discreetly tie a Walkman recorder to their waist and leave it running for anything up to two weeks. Every conversation they had was recorded. When the data were collected, the length of tapes was 35 times the depth of the Atlantic Ocean. Teams of audio typists transcribed the tapes to produce a computerized database of ten million words.
- 3 This has been the basis – along with an existing corpus – for the *Language Activator Dictionary*, described by lexicographer Professor Randolph Quirk as "the book the world has been waiting for." It shows advanced foreign learners of English how the language is really used. In the dictionary, key words like "eat" are followed by related phrases like "wolf down" or "be a picky eater," allowing the student to choose the appropriate word.
- 4 "This kind of research would be impossible without computers," said Della Summers, a director of dictionaries. It has transformed the way lexicographers work. If you look at the word "like", you may intuitively think the first and most frequent meaning is the verb, as in "I like swimming." It is not. It is the preposition, as in: "she walked like a duck." That a word or phrase is used does not mean it ends up in a dictionary. The sifting out process is as vital as ever. But the database does allow lexicographers to search for a word and find out how frequently it is used – something that could only be guessed at intuitively before.
- 5 The Spoken Corpus computer shows how inventive and humorous people are when they are using language by twisting familiar phrases for effect. It also reveals the power of the pauses and noises we use to play for time and convey emotion, doubt and irony.
- 6 For the moment, those benefiting most from the Spoken Corpus are foreign learners. "Computers allow lexicographers to search quickly through more examples of real English," said Professor Geoffrey Leech of Lancaster University. "They allow dictionaries to be more accurate and give a feel for how language is being used." The Spoken Corpus is part of the larger British National Corpus, an initiative carried out by several groups involved in the production of language learning materials: publishers, universities and the British Library.

Questions 31-35

From the list of headings below, choose the most suitable heading for each of the paragraph asked.

List of Headings

- A New Method of Compiling Dictionaries
- B Non-verbal Content
- C Traditional Lexicographical Methods
- D Accurate Word Frequency Counts
- E Alternative Expressions Provided

- 31. Paragraph 1
- 32. Paragraph 2
- 33. Paragraph 3
- 34. Paragraph 4

· 係用打字或複寫時，請將用過之複寫紙與試題一併檢回 ·

式) 國立東華大學 八十八 學年度碩士班招生考試試題

科 目：英文

共 四 頁 第 四 頁

35. Paragraph 5

Questions 36-40

Choose the best answer to each question asked.

36. Why was this article written?

- (A) To give an example of current dictionary.
- (B) To announce a new approach to dictionary writing.
- (C) To show how dictionaries have progressed over the years.
- (D) To compare the content of different dictionaries.
- (E) To criticize the past dictionaries.

37. According to the passage, which of the following is NOT true about the Language Activator Dictionary?

- (A) It uses only spoken corpus.
- (B) There were 150 people who volunteered to record conversations from their daily lives.
- (C) The Spoken Corpus is a cooperative research project.
- (D) The dictionary contains relevant words in each entry.
- (E) Professor Randolph Quirk welcomes the publication of this dictionary.

38. According to the passage, the portrayal of feelings could be through

- (A) pauses and noises
- (B) speaking aloud
- (C) music
- (D) animals
- (E) foreign learners

39. According to the passage, what is the most frequently used meaning of "like"?

- (A) as a verb
- (B) as a preposition
- (C) both as a verb and a preposition
- (D) as an adverb
- (E) as a noun

40. In the passage, which of the following words is used to describe the image of traditional dictionaries?

- (A) inventive
- (B) vital
- (C) advanced
- (D) dry
- (E) humorous

I. Microeconomics

應以原子筆或鋼筆作答。可以中文、英文或中英合併之方式回答。
每題所佔之百分比皆附註於題後。

1. Suppose that firm DH produces only one output y and is the only firm in the market. There are two factors (x_1, x_2) needed for its product and the market prices are (w_1, w_2) , respectively. The production function for the firm is $f(x_1, x_2) = \min\{x_1, x_2\}$.
 - (a) What kind of return to scales for the production function firm DH has? (5%)
 - (b) Please find the minimal cost function $c(w_1, w_2, y)$. Assume knowing $w_1=40$. (5%)
 - (c) Given the market demand is $y = 100 - p$. What is the profit function respect to the price of x_2 (that is w_2)? (5%)
 - (d) Now if $w_2=40$, how many outputs will the firm DH decide to produce? How about if $w_2=70$, how many outputs will the firm DH decide to produce? (5%)
 - (e) Now if the price of x_2 is unknown. But the firm wants to have at least 10% rate of return when output $y = 34$. What will the maximum price the firm DH should pay for factor x_2 ? (5%)

2. City A is going to build 700 parking spaces in its Central Business District. The total cost for this project is 10,000 dollar. Suppose that the demand function of the parking space is $P = 100 - 0.1X$ where P is the parking fee and X is the units of parking space.
 - (a) If the City government's goal of this project is to maximize the total parking revenue, then what price should City government charge? How much the revenue will be? (10%)
 - (b) If the government's goal for this project is to maximize the social welfare, then what price should City government charge? How much the social welfare will be? (10%)
 - (c) If the mayor is going to set the parking fee zero, from an economic perspective, will you agree his/her price policy? Why? (5%)

II. Macroeconomics:

- Following the neoclassical growth model, suppose that an ideal economy is characterized by the following production function, $Y = 5K^{0.5}N^{0.5}$, where Y, K and L are total output, capital stock and labor force, respectively. The saving rate is 0.2, the population growth rate is 0.01 and the depreciation rate is 0.09. What is the capital-labor ratio in the steady state? What is the per capita output in steady state? What is the steady-state value of consumption per worker? Does this steady state satisfy the golden rule of capital accumulation? Why? Or why not? (25%)
- Assume that a hypothetical country produces only three goods, apple, banana and orange. Information regarding output and prices is given below: (25%)

	Year 1		Year 2	
	Quantities	Prices	Quantities	Prices
Apple	20	\$1.0	40	\$0.5
Banana	60	\$0.5	40	\$1.0
Orange	30	\$0.1	100	\$0.5

Please find the following indices of year 2 by assuming year 1 as the base year:

- the real GDP index at fixed year 1 prices;
- the real GDP index at fixed year 2 prices;
- the chain-weighted real GDP index;
- the GDP deflator at fixed year 1 quantities;
- the GDP deflator at fixed year 2 quantities;
- the chain-weighted GDP deflator;
- the nominal GDP index and
- the implicit GDP deflator.