

(Ten points for each question)

1. Assume that number and count are int variables in the following java code statements. Describe the output produced for the following inputs:

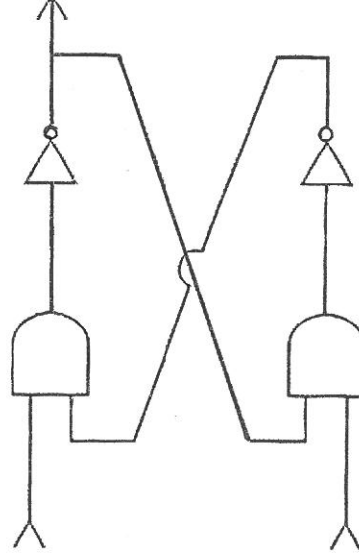
(a) 5

(b) -4

```
1. count = theKeyboard.readInt();
   number = 0;
   for ( ;; )
   {
       if (number > count) break;
       theScreen.println(number);
       number++;
   }

2. count = theKeyboard.readInt();
   number = 0;
   for ( ;; )
   {
       theScreen.println(number);
       number++;
       if (number > count) break;
   }
```

2. Assume that both of the inputs in the following circuit are 1. Describe what would happen if the upper input were temporarily changed to 0. Describe what would happen if the lower input were temporarily changed to 0 thereafter. Redraw the circuit using NAND gates.



3. Please briefly describe the difference between a complex instruction set computer (CISC) architecture and a reduced instruction set computer (RISC) architecture.
4. If a typist types seventy words per minute (assume a word is with six characters), how much time would pass between typing each character? If a multiprogramming operating system allocated time slices in 10 millisecond units and we ignore the time required for process switches, how many time slices could be allocated between characters being typed?
5. Please differentiate the concepts of parallel processing, grid computing, web services and cloud computing.
6. How does cache memory speed up the computer?
7. How does CSMA/CD work? Explain why it cannot apply to wireless networks.
8. What is data remanence? Please explain why it is still possible to recover overwritten data.
9. Define data compression. Why is it still an important consideration for software developers nowadays?
10. When recording data on a multiple-disk storage, should the users fill a complete disk surface before starting on another surface, or should the users fill an entire cylinder before starting on another cylinder? Please explain why in details.

問答題四題，每題 25 分。

1. Please answer the following questions regarding social networks.
 - a. Can social networks enhance a firm's reputation? If yes, how? If no, why?
 - b. Can social networks tarnish a firm's reputation? If yes, how? If no, why?
 - c. What sorts of restrictions or guidelines should firms place on the use of social networks by their employees?
2. Please answer the following questions regarding information systems project risk.
 - a. Identify and describe each of the principal risk factors in information systems projects.
 - b. Identify and describe the strategies for controlling project risk.
 - c. Explain why there is such a high failure rate for implementations involving enterprise applications, business process reengineering, and mergers and acquisitions.
3. Please answer the following questions regarding information systems security and reliability.
 - a. List and describe the most common threats against contemporary information systems.
 - b. Describe the system security and reliability problems created by employees.
 - c. Explain how software defects affect systems reliability and security.
4. Please answer the following questions regarding cloud computing.
 - a. List and describe the benefits and limitations of cloud computing.
 - b. Identify and describe the value of cloud computing to a small organization.
 - c. Identify and describe the value of cloud computing to an entrepreneur who is starting a business.

Briefly answer the following questions.

1. Please read the following items in order, and construct the corresponding trees.

Sep, Aug, Jul, Feb, Jun, May, Mar, Jan, Apr

- (1) Binary search tree. (5%)
- (2) AVL tree. (7%)
- (3) 2-3 tree. (8%)

2. Please write a program that uses a stack to determine whether a string is a palindrome (i.e., the string is spelled identically backward and forward). The program should ignore capitalization, spaces and punctuation. (25%)

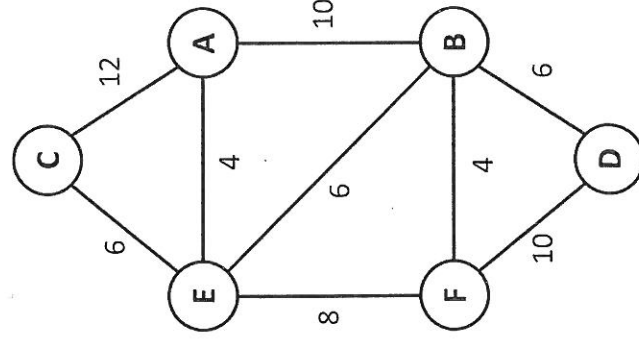
3. Given an input list {13, 1, 15, 23, 7, 21, 3, 11, 19, 5, 17}, please demonstrate how the following two sorting methods sorts the list.

- (1) Insertion sort. (10%)
- (2) Heap sort. (10%)

4. (1) Describe the hashing technique. (5%)

- (2) How to solve the hash collision problem? (At least THREE kinds of methods should be provided). (15%)

5. Given the graph below:



- (1) Draw the minimum spanning tree of the graph. (5%)
- (2) Find the shortest path between Node C and all other nodes in the graph. (5%)
- (3) Provide the adjacency matrix representation of the graph. (5%)

Multiple Choice Questions (24%, 4% per question)

Please select one and only one most appropriate answer.

1. If 35% of the students in my statistics class use the Google mail (or gmail), I conclude from this that 35% of all students at the University have gmail accounts. The most important logical weakness of this conclusion would be:
A) relying on any sample instead of surveying every student.
B) using a sample that may not be representative of all students.
C) failing to correct for unconscious interviewer bias.
D) assuming cause and effect where none exists.
2. The Dean of Students mailed a survey to a total of 400 students. The sample included 100 students randomly selected from each of the freshman, sophomore, junior, and senior classes on campus last term. What sampling method was used?
A) simple random sample B) systematic sample
C) stratified sample D) cluster sample
3. A drug company wanted to test a new indigestion medication. The researchers found 400 adults aged 25-35 and randomly assigned them to two groups. The first group received the new drug, while the second received a placebo. After one month of treatment, the percentage of each group whose indigestion symptoms decreased was recorded and compared. How many levels does the treatment in this experiment have?
A) 2 (medication or placebo) B) 400 (number of respondents)
C) 1 (months of treatment) D) 10 (age span of respondents)
4. A regression intercept represents:
A) the slope of the line. B) the amount of change in Y given a one unit change in X.
C) the value of Y when X is equal to zero. D) the strength of the X-Y relationship.
5. Which is not a likely area of application of statistics in business?
A. Auditing supplier invoices for correct payment.
B. Questioning the executives' strategic decisions.
C. Looking for patterns in a large marketing database.
D. Making forecasts of several key product lines.
6. How many degrees of freedom are there in a 5x7 contingency table when the chi-square test of association is used?
A) 12 B) 24 C) 30 D) 35 E) None of the above.

Computational Questions (76%)

Please clearly show your calculations in detail.

- C1. To test if a certain training course can improve performance of production line workers, the researcher randomly selected 6 workers and wrote down their performance indicators before and after the training course, as below: (The performance indicators are normally distributed)

Employee	1	2	3	4	5	6
Perf. indicator before training (X)	110	125	100	90	110	130
Perf. indicator after training (Y)	113	121	103	92	112	125

Given the sum of $x^2 = 74825$, the sum of $y^2 = 74652$, the sum of $xy = 74705$, $\alpha = 0.05$

- (A) Please conduct hypothesis testing on the effectiveness of the training course using t statistics. (12%)
(B) Please calculate and present the linear regression equation for predicting Y from X. (12%)
(C) Please use ANOVA to test if the regression equation slope equals zero. (12%)

- C2. 已知在總人口中帶有某遺傳基因 K 的比率為 5%，而目前測試遺傳基因 K 的檢驗對於帶有基因 K 者有 5% 的機率呈現陰性，對於未帶基因 K 者有 2% 機率呈現陽性。今隨機檢驗一人是否帶有基因 K，請問：

- (A) 此人呈現陽性反應的機率為何？(10%)
(B) 若已知此人檢驗結果呈現陽性反應，但此人並未帶有基因 K 的機率為何？(10%)

- C3. 某企業抽出 50 名員工並調查其年齡，發現平均年齡為 36 歲，標準差為 12 歲。請問：

- (A) 員工平均年齡之 95% 信賴區間為何？(10%)
(B) 若希望員工平均年齡的 95% 信賴區間能調整到 (33, 39)，請問應抽取多少樣本？(10%)

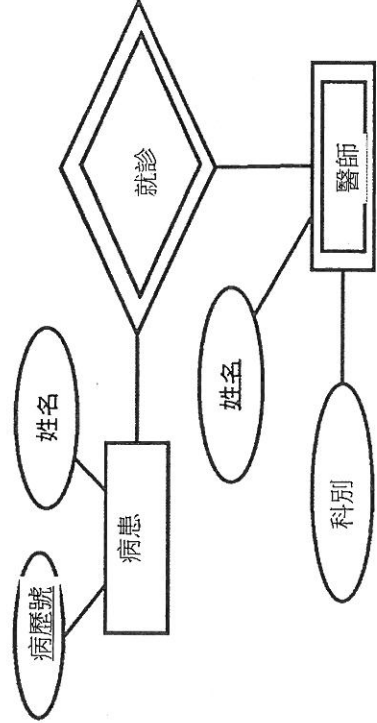
F critical values		Degrees of freedom in the denominator																					
p		Degrees of freedom in the numerator																					
		7	6	5	4	3	2	1	7	6	5	4	3	2	1	7	6	5	4	3	2	1	
.100	.100	58.91	52.80	52.24	52.83	55.83	9.16	39.86	53.59	224.58	230.16	233.99	236.77	248.58	279.68	39.86	38.51	37.67	37.15	36.78	36.46	36.17	35.91
.050	.050	52.80	47.97	47.33	47.85	50.85	9.16	35.91	215.71	224.58	229.11	232.99	235.71	247.51	278.61	35.91	34.56	33.72	33.20	32.83	32.54	32.27	32.02
.025	.025	49.81	45.04	44.40	44.92	47.92	9.16	32.99	205.55	215.71	220.24	224.12	226.84	238.64	270.74	32.99	31.64	30.80	30.28	29.91	29.62	29.36	29.11
.010	.010	45.99	41.22	40.58	41.10	44.10	9.16	29.36	195.40	205.55	210.08	213.96	216.68	228.48	260.58	29.36	28.01	27.17	26.65	26.28	26.00	25.74	25.49
.001	.001	42.79	38.02	37.38	37.90	40.90	9.16	26.21	185.25	195.40	200.93	204.81	207.53	219.33	251.43	26.21	24.86	24.02	23.50	23.13	22.85	22.59	22.34
.100	.100	35.91	31.08	30.44	30.96	33.96	9.16	23.12	175.10	185.25	190.78	194.66	197.38	209.18	241.28	23.12	21.77	20.93	20.41	20.04	19.76	19.50	19.25
.050	.050	31.00	26.17	25.53	26.05	29.05	9.16	19.97	164.95	175.10	180.63	184.51	187.23	199.03	231.13	19.97	18.62	17.78	17.26	16.89	16.61	16.35	16.10
.025	.025	27.15	22.32	21.68	22.20	25.20	9.16	17.82	154.80	164.95	170.48	174.36	177.08	188.88	220.98	17.82	16.47	15.63	15.11	14.74	14.46	14.20	13.95
.010	.010	24.99	20.16	19.52	20.04	23.04	9.16	16.68	144.65	154.80	160.33	164.21	166.93	178.73	210.83	16.68	15.33	14.49	13.97	13.60	13.32	13.06	12.81
.001	.001	22.81	17.98	17.34	17.86	20.86	9.16	15.54	134.50	144.65	150.18	154.06	156.78	168.58	200.68	15.54	14.19	13.35	12.83	12.46	12.18	11.92	11.67
.100	.100	18.51	13.68	13.04	13.56	16.56	9.16	12.47	124.35	134.50	139.03	142.91	145.63	157.43	189.53	12.47	11.12	10.28	9.76	9.39	9.11	8.85	8.60
.050	.050	16.01	11.18	10.54	11.06	14.06	9.16	11.32	114.20	124.35	128.88	132.76	135.48	147.28	179.38	11.32	10.00	9.16	8.64	8.27	8.00	7.74	7.49
.025	.025	14.26	9.43	8.79	9.31	12.31	9.16	10.17	104.05	114.20	118.73	122.61	125.33	137.13	169.23	10.17	8.85	8.01	7.49	7.12	6.85	6.59	6.34
.010	.010	12.59	7.76	7.12	7.64	10.64	9.16	9.00	93.90	104.05	108.58	112.46	115.18	126.98	159.08	9.00	7.68	6.84	6.32	5.95	5.68	5.42	5.17
.001	.001	11.15	6.32	5.68	6.20	9.20	9.16	8.03	83.75	93.90	98.43	102.31	105.03	116.83	148.93	8.03	6.71	5.87	5.35	4.98	4.71	4.45	4.20
.100	.100	8.45	3.62	3.00	3.52	6.52	9.16	6.36	73.60	83.75	88.28	92.16	94.88	106.68	138.78	6.36	5.04	4.20	3.68	3.31	3.04	2.78	2.53
.050	.050	7.71	2.88	2.26	2.78	5.78	9.16	5.61	68.45	78.60	83.13	87.01	89.73	101.53	133.63	5.61	4.29	3.45	2.93	2.56	2.29	2.03	1.78
.025	.025	7.08	2.25	1.63	2.15	5.15	9.16	5.00	63.30	73.45	77.98	81.86	84.58	96.38	128.48	5.00	3.68	2.84	2.32	1.95	1.68	1.42	1.17
.010	.010	6.45	1.62	1.00	1.52	4.52	9.16	4.37	58.15	68.30	72.83	76.71	79.43	91.23	123.33	4.37	3.05	2.21	1.69	1.32	1.05	0.79	0.54
.001	.001	5.82	1.00	0.38	0.90	3.90	9.16	3.74	53.00	63.15	67.68	71.56	74.28	86.08	118.18	3.74	2.42	1.58	1.06	0.69	0.42	0.16	0.01

		Upper-tail probability p										Confidence level C									
		.25	.20	.15	.10	.05	.025	.02	.01	.005		50%	60%	70%	80%	90%	95%	96%	98%	99%	
1	1.000	1.376	1.563	1.846	2.202	2.849	3.581	4.541	5.841	7.879	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
2	0.816	1.061	1.286	1.586	2.000	2.658	3.385	4.353	5.591	7.709	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
3	0.765	0.978	1.250	1.638	2.157	2.892	3.619	4.587	5.814	7.932	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
4	0.741	0.941	1.250	1.638	2.157	2.892	3.619	4.587	5.814	7.932	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
5	0.727	0.920	1.156	1.476	2.015	2.757	3.484	4.452	5.679	7.797	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
6	0.718	0.906	1.134	1.440	2.015	2.757	3.484	4.452	5.679	7.797	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
7	0.711	0.896	1.119	1.415	1.895	2.635	3.362	4.330	5.557	7.675	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
8	0.706	0.889	1.108	1.397	1.860	2.606	3.333	4.301	5.528	7.648	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
9	0.703	0.883	1.100	1.383	1.853	2.602	3.325	4.294	5.521	7.641	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
10	0.700	0.879	1.093	1.372	1.842	2.598	3.319	4.287	5.517	7.634	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
11	0.697	0.876	1.088	1.363	1.836	2.594	3.314	4.282	5.513	7.629	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
12	0.695	0.873	1.083	1.356	1.827	2.590	3.309	4.277	5.509	7.624	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
13	0.694	0.870	1.079	1.350	1.822	2.587	3.305	4.274	5.506	7.620	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
14	0.692	0.868	1.076	1.345	1.817	2.584	3.301	4.270	5.502	7.616	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
15	0.691	0.866	1.074	1.341	1.813	2.581	3.298	4.267	5.499	7.612	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
16	0.690	0.865	1.071	1.337	1.810	2.579	3.295	4.264	5.496	7.609	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
17	0.689	0.863	1.069	1.333	1.807	2.576	3.292	4.261	5.493	7.606	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
18	0.688	0.862	1.067	1.330	1.804	2.574	3.289	4.258	5.490	7.603	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
19	0.688	0.861	1.066	1.328	1.802	2.572	3.287	4.256	5.488	7.601	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
20	0.687	0.860	1.064	1.325	1.800	2.570	3.285	4.254	5.486	7.599	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
21	0.686	0.859	1.063	1.323	1.798	2.568	3.283	4.252	5.484	7.597	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
22	0.686	0.858	1.061	1.321	1.796	2.566	3.281	4.250	5.482	7.595	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
23	0.685	0.858	1.060	1.319	1.794	2.564	3.279	4.248	5.480	7.593	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
24	0.685	0.857	1.059	1.318	1.792	2.562	3.277	4.246	5.478	7.591	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
25	0.684	0.856	1.058	1.316	1.790	2.560	3.275	4.244	5.476	7.589	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
26	0.684	0.856	1.058	1.315	1.789	2.559	3.274	4.243	5.475	7.588	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
27	0.684	0.855	1.057	1.314	1.788	2.558	3.273	4.242	5.474	7.587	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
28	0.683	0.855	1.056	1.313	1.787	2.557	3.272	4.241	5.473	7.586	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
29	0.683	0.854	1.055	1.311	1.786	2.556	3.271	4.240	5.472	7.585	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
30	0.683	0.854	1.055	1.310	1.785	2.555	3.270	4.239	5.471	7.584	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
40	0.681	0.851	1.050	1.303	1.784	2.551	3.263	4.233	5.464	7.574	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
50	0.679	0.849	1.047	1.299	1.782	2.549	3.259	4.229	5.460	7.569	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
60	0.679	0.848	1.045	1.296	1.781	2.548	3.258	4.228	5.459	7.568	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
80	0.678	0.846	1.043	1.292	1.779	2.546	3.256	4.226	5.457	7.566	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
100	0.677	0.845	1.042	1.290	1.778	2.545	3.255	4.225	5.456	7.565	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57
1000	0.674	0.841	1.036	1.282	1.771	2.544	3.254	4.224	5.454	7.564	15.89	12.71	10.65	8.45	6.31	4.84	3.84	3.47	3.16	2.88	2.57

1. Briefly describe the following terms occurring in Database (20% (4% for each))

- a. two-phase locking
- b. lock compatible table
- c. update anomaly
- d. concurrent control
- e. Rollback

2. (a) For the following E-R diagram, please design the database schema for it. We assume a patient can visit the doctors many times, and a doctor can care many patients. The attributes in circles with underline means the primary key. (b) What is the problem that the name (姓名) for the 醫師 is set as a primary key? (20%)



3. The following is the course-student-teacher tables, containing the student number, student's birthday, student name, course number, course name, credit of the course, number of students for the course, student's score for the course, and the class room with the teaching time for a course. Please transform the unnormalized table into the 3NF table through 1NF, and 2NF Tables. (20%)

Stud ent#	Birth Date	Nam e	Course #	Course name	Teache r	Cred it	# of students	Score	Class room
14	12/6	Lee	mis38	DB	John	3	2	90	MB101 (3 hours)
14	12/6	Lee	mis40	MIS	Mary	2	1	80	MB349(1 hour), MB102(1 hour)
15	1/6	Pat	mis38	DB	John	3	2	70	MB101(3 hours)

4. For a DBA, he/she may use the ER-model to model the world; but for a programmer, he/she may use objects and classes to model the world. (a) What is the difference between the ER-model and object diagrams? (b) If you get the ER-model and object diagrams for a same project to be coded, how do you merge the two models for programming? (20%)
5. For the following two tables of a bank, please write the (standard) SQL statements for the following assertions.

Staff

staffNo	sName	position	salary	branchNo	Branch	
					branchNo	bAddress
SL21	John White	Manager	30000	B005		
SG37	Ann Beech	Assistant	12000	B003		
SG14	David Ford	Supervisor	18000	B003		
SA9	Mary Howe	Assistant	9000	B007		
SG5	Susan Brand	Manager	24000	B003		
SL41	Julie Lee	Assistant	9000	B005		
					B005	22 Deer Rd, London
					B007	16 Argyll St, Aberdeen
					B003	163 Main St, Glasgow

- a. show the staff's name and position if his/her salary is over 10000;
- b. find the staff (name) if he/she work in London
- c. Update the branch B007's address to "168 university RD, Chia-Yi"
- d. Find all the branch's staffs, please group by the branch and sort them by their salary from high to low.
(20% (5% for each))

作答說明：本測驗共四大部分，共 50 題，每題配分皆為 2 分。本測驗試題皆為單一選擇題，請選出一個正確或最適當的答案，答錯不倒扣。答案需依題號順序清楚填答在答案卷。考完後需將「答案卷」及「試題卷」一併繳回。

Part 1: Vocabulary (40%, 每題 2 分)

1. We can make simpler ways to help stop global warming or at least reduce its effects. At home or in the office, choose lighting fixtures and appliances that are eco-friendly, meaning that they don't ___ too much energy and generate too much heat.
(A) conserve (C) presume
(B) waste (D) consume
2. According to a team of U.S. and Chinese researchers, the smog made in China does not stay there. Their findings indicate the pollution is ___ across the Pacific Ocean and clouding air in the United States.
(A) drifting (C) gliding
(B) shifting (D) grinding
3. Noodles are not only an important staple food in Taiwan, but are also eaten on special occasions such as birthdays and weddings, because they ___ something that is long-lasting.
(A) designate (C) specify
(B) symbolize (D) illustrate
4. The company had a hiring problem and couldn't find the right people—the 'sales pros' who could explain the ___ of a camera without using complex explanations of terms like aperture or audio format.
(A) heritages (C) attributes
(B) features (D) origins
5. When asked what would be the biggest factors behind change in the coming years, 82% of global bosses said ___ in technology would have the most impact.
(A) advances (C) degenerations
(B) expansions (D) deteriorations
6. Over 85% of the fine particles and ___ chemicals in second-hand smoke are invisible and levels of harmful particles can reach very high peaks when the smoke lingers in the air for long after the cigarette is extinguished."
(A) risky (C) hazardous
(B) wounding (D) critical
7. The Nobel Prize in Economics in 2013 has been awarded to three academics who have ___ our understanding of stock and house prices.
(A) rehabilitated (C) transformed
(B) renovated (D) originated
8. Avoid fast foods and junk foods, in order to have chemical-free life or reduce our ___ to the chemicals.
(A) exposure (C) introduction
(B) processing (D) coverage
9. With no approved medications to treat cancer, her parents are turning to ___ therapies.
(A) probable (C) alternative
(B) conventional (D) mysterious
10. By setting up branch offices abroad, he hopes to ___ the business and boost sales.
(A) dominate (C) invest
(B) expand (D) transport
11. According to a recent research study, the quality of higher education in many countries continues to ___ due to a lack of funding.
(A) minimize (C) underlie
(B) recess (D) decline
12. Today, one can hardly talk about environmental protection without mentioning ___ development.
(A) evolitional (C) forthcoming
(B) groundbreaking (D) sustainable
13. The newly-opened driving center offers a full ___ of courses, from beginner to more advanced training.
(A) range (C) section
(B) category (D) version
14. Winning an Academy Award is perhaps the ___ goal of many Hollywood artists.
(A) essential (C) ultimate
(B) primate (D) contemporary

15. Alcohol consumption, together with the high intake of calories from junk food, has turned the holiday season into a time of _____.
 (A) recess (C) access
 (B) excess (D) success
16. The public are more aware of health hazards, food _____ and food safety; therefore, consumers tend to buy organic food nowadays.
 (A) additives (C) supplements
 (B) extracts (D) concentrations
17. Taipei 101, surely _____ among the tallest man-made construction on the planet.
 (A) attributes (C) sorts
 (B) classifies (D) ranks
18. Fortunately, the transmission of the _____ disease is successfully controlled by the breakthrough in vaccination.
 (A) infectious (C) superstitious
 (B) pretentious (D) precautions
19. The government established several _____ shelters after the severe landslide brought by the super typhoon.
 (A) emigration (C) evacuation
 (B) accommodation (D) inhabitation
20. If you would like to spend time _____ the unspoiled nature of Africa, check out the pamphlets from the local tour agents.
 (A) circulating (C) advancing
 (B) marching (D) exploring

Part 2: Cloze (20% , 每題 2 分)

Directions: Read the passages below. Some words or phrases are missing in the texts of the paragraphs. Choose the appropriate words or phrases that best fit the blanks in the passages to complete the texts.

Questions 21-25 refer to the following passage.

The total population suffering from diabetes will have reached 366 million around the world by 2030. Some scientists have cast doubts on the value of modern medicine to protect (21) _____ diabetes because this disease consumes a large amount of health budget. However, a(n) (22) _____ news is that a Taiwanese research team has found a crucial substance which might (23) _____ diabetes. Since plant extracts are by far the most common elements used in traditional Chinese medicine, the team looked at the (24) _____ of several herbal ingredients and claimed that monascus, a substance found in red yeast rice, could prevent diabetes from deteriorating. This kind of medical discovery will create an (25) _____ on and expedite the development of further herbal medicine research.

21. (A) upon (C) against
 (B) over (D) under
22. (A) gloomy (C) anxious
 (B) inspiring (D) shocking
23. (A) restrain (C) restrict
 (B) moderate (D) prevent
24. (A) effects (C) factors
 (B) defects (D) reflects
25. (A) affect (C) usage
 (B) effort (D) impact

Questions 26-30 refer to the following passage.

You may be familiar with carbon footprint, but have you heard of water footprint? Water footprint is a(n) (26) _____ of water use that looks at both direct and indirect water use of a consumer or producer. Since water problems are often closely tied to the structure of the global economy, calculating water footprint can help (27) _____ global awareness about these problems. For example, many countries have significantly externalized their water footprint, importing water-intensive goods from elsewhere. This puts pressure (28) _____ the water resources in the exporting regions, (29) _____ too often mechanisms for wise water governance and conservation are lacking. Not only governments, but also consumers, businesses and civil society communities can play a role in (30) _____ a better management of water resources.

26. (A) symbol (C) signal
 (B) indicator (D) framework

27. (A) draw (C) bring
(B) attract (D) raise
28. (A) to (C) on
(B) for (D) in
29. (A) when (C) where
(B) why (D) how
30. (A) articulating (C) formulating
(B) achieving (D) retaining

Part 3: Reading Comprehension (20% , 每題 2 分)

Directions: In this part, you will read two passages. Read the passages carefully and then select the best answer to each question.

Questions 31-36 refer to the following passage.

Shrimp is popular seafood. As delicious as shrimp may be, we actually should not be eating them. Shrimp is either farmed or wild, but neither option is good for the environment. Farmed shrimp are kept in ponds on the coast, where the tide can refresh the water and carry waste out to sea. Ponds are prepared with heavy doses of chemicals where the shrimp receive pesticides and antibiotics. Shrimp farmers have destroyed an estimated 38 percent of the world's mangroves to create shrimp ponds, and the damage is permanent. Not only do the mangroves not return long after production has ended, but the surrounding areas become wastelands. Wild shrimp isn't a better option because it usually involves the use of deep-sea trawlers, which kills 5 to 20 pounds of "bycatch" (unwanted species of fish accidentally scooped up by the trawler's net) for every pound of shrimp. As for health risks, researchers found 162 separate varieties of bacteria with resistance to 10 different antibiotics in imported ready-to-eat shrimp. There aren't many 'good' options for those who still want to eat shrimp. Until production standards change dramatically, buying shrimp only perpetuates a horrible system.

31. What is the main purpose of the passage?

- (A) To explain why shrimp is bad seafood.
(B) To describe how shrimp production functions.
(C) To suggest options for people who love shrimp.
(D) To persuade people to stop eating shrimp.

32. What impact would wild shrimp have on the environment, according to the passage?

- (A) Their everlasting damage is done to the surrounding areas.
(B) The use of deep-sea trawlers kills species of fish.
(C) The use of pesticides and antibiotics pollutes sea water.
(D) Their waste in the surrounding sea contains varieties of bacteria.

33. Which of the followings about farmed shrimp is true?

- (A) They are more popular than wild shrimp.
(B) They need to be kept in fresh water.
(C) Their production requires ten different antibiotics.
(D) Their production turns mangroves into wastelands.

34. What does the word "return" mean in the passage?

- (A) To grow.
(B) To renew.
(C) To survive.
(D) To prosper.

35. Which of the following statements would the author most agree with?

- (A) Standards for shrimp production will never change.
(B) The government should not import shrimp from developing countries.
(C) Shrimp lovers are part of the terrible shrimp production system.
(D) Eating wild shrimp with less amount of chemicals is better than eating farmed shrimp.

Questions 36-40 refer to the following passage.

Talent scarcity or the feeling it is coming on soon is rising to the top of the agenda for the current global business leaders. In parts of Asia, companies are struggling to cope with a workforce that consistently job-hops – rather than sticking with one firm and gradually creating value for that company by keeping skills and knowledge there. Europe contends with a "frozen middle management," leaving chief executives trying to find ways to boost new ideas. On a global scale, some of the largest companies point out that it's actually a mix of skills and backgrounds that are crucial to expanding their global business, but attaining this kind of diversity is difficult.

As companies look to build their talent pipelines, many are trying more innovative ideas to combat scarcity of certain skills. Some are introducing their brands to potential employees who previously were not even interested in

an interview. The Boston office at education giant Kaplan Inc, has recently launched a 12-week camp for people within the Boston area who are looking to boost their skills. Graduates of the camp are sometimes offered jobs at Kaplan. Meeting potential candidates long before they apply for a job helps the company to expand their brand.

36. **What is the main idea of the passage?**

- (A) The shortage of the skilled workforce.
- (B) The deficiency of global leaders.
- (C) The struggle of global companies.
- (D) The diversity of global businesses.

37. **What problem are the global businesses in Asian areas facing, according to the passage?**

- (A) Struggling to find the skilled workforce.
- (B) Struggling to find the workforce with similar value.
- (C) Frequent job changing of the company employees.
- (D) Consist job hogging of the company leaders.

38. **Which of the followings is important for some large global companies to expand their business, according to the passage?**

- (A) To create a mix of skills and backgrounds of the employees.
- (B) To cope with a workplace for consistent job hoppers.
- (C) To create a corporate value to fit the job-hopping trend.
- (D) To stick with a consistent value that the companies create.

39. **Why is Kaplan, an education giant, mentioned in the passage?**

- (A) To show how a company can expand its brand through hiring potential employees.
- (B) To illustrate how a company meet potential candidates before job applying.
- (C) To show how a global company encourages job searchers apply for its jobs.
- (D) To illustrate how a company can boost skills of new hires and expand its brand.

40. **What does the word “launched” mean in the passage?**

- (A) Released.
- (B) Expanded.
- (C) Promoted.
- (D) Initiated.

Part 4: Writing Skills (20% , 每題 2 分)

A. Writing at sentence level: Choose the one mistake in the sentence.

41. The thinning of the ozone layer that protects the Earth (A) with the sun's intense heat is tremendous and it has apparently (B) caused increase of the Earth's temperature that is capable of (C) creating heat waves to (D) affected countries.
 (A) A (C) C
 (B) B (D) D
42. The volcano eruption covered all of the western U.S. are among the largest known to have ever (A) occurred on Earth, (B) produced drastic climate change (C) in the (D) aftermath.
 (A) A (C) C
 (B) B (D) D
43. Fatigue and alcohol are two known triggers for memory lapse, (A) so (B) avoid these can help in situations (C) where you need to (D) stay sharp.
 (A) A (C) C
 (B) B (D) D
44. No matter (A) how many times she (B) has tried to stop, she just can't give up (C) search for the perfect recipe that many have said (D) not existing.
 (A) A (C) C
 (B) B (D) D
45. According to eight police officers who emerged (A) from different directions (B) to deliver eight variations of warnings, pedestrians (C) forbid to cross from one side to (D) the other.
 (A) A (C) C
 (B) B (D) D

B. Writing at paragraph level: The topic sentence or one of the sentences in each paragraph has been missing.
 Choose the best answer to complete each paragraph.

46.

There are three reasons why Norway is one of the best countries in the world. First, it has an excellent health care system. All Norwegians have access to medical services at a reasonable price. Second, Norway has a high standard of education. Students are taught by well-trained teachers and most of the people continue studying at university. Finally, its cities are clean and efficiently managed. Norwegian cities have many parks and lots of space for people to live. As a result, _____.

- (A) Norway is ideal for higher education.
- (B) Norway is a perfect sightseeing location for tourists.
- (C) Norway is affordable for most people to love.
- (D) Norway is a desirable place to live.

47.

_____. From the earliest times, kings used initial rings to sign document. Later, during Greek times, when Alexander the Great died, his vast kingdom was divided among his generals, who also got copies of his signet ring. They used these themselves and even allowed trusted advisors to use them. Finally, the custom spread among the common people, and nearly everybody who couldn't write signed official documents with a signet ring. Rings thus became a sign of contractual agreement, which meaning was eventually applied to wedding rings.

- (A) The importance of the rings is initially documented since earlier times in history.
- (B) The custom of using rings in weddings is documented officially since Greek times.
- (C) The use of wedding rings has evolved as the latest of all the bridal traditions.
- (D) The use of rings has been popular for new-weds for a long time.

48.

The general principles of making cheese from milk have changed little for nearly 3000 years. _____. The first step is to add acid or enzyme to the milk. Next, the liquid, called whey, is drained, leaving a semi-solid cheese, called curds. All soft or cream cheeses are of this type. Hard cheese undergoes two additional steps in the process. The semi-solid cheese is matured, salted and pressed into forms or moulds. The final step is the aging process during which the world's most famous cheeses acquire their unique flavors from the place and length of storage.

- (A) All the methods are slightly changed.
- (B) Making cheese is not an easy task at all.
- (C) The process consists of two to four basic steps.
- (D) The principles are followed in different cultures.

49.

_____. The highest of these castes is that of the Brahmins or priests. The next highest is the varna of the warriors, known as the Rajput caste. Below this comes the merchant caste and the lowest caste is known as the Sudra caste. While castes are traditionally associated with a type of occupation, in modern India, occupations are not a reliable guide to caste.

- (A) The Hindu people have been emphasized the hierarchical status under the castes.
- (B) The whole Hindu population of India can be divided into four castes.
- (C) The castes in India are placed at the top in the traditional society.
- (D) The castes in India are part of tradition in the Hindu history.

50.

Alex loves to jog. He has strong legs, so jogging is easy for him. _____. He started jogging a year ago to get in shape, but now he runs because he loves it. He has even run in a few marathons, and he enjoys the competition. Alex says that he'll run until the day he dies.

- (A) He has a lot of friends who love jogging as much as he does.
- (B) He also has good endurance, and his lungs seldom ache.
- (C) He often cramps up because he has tight muscles.
- (D) He has enjoyed running in marathons ever since.

