國立雲林科技大學

99學年度碩士班暨碩士在職專班招生考試試題

系所：工管所、資管系

科目：統計學(1)

1. 說明以下名詞：

(a) (2%) 機率與機率密度函數 (probability density function)

(b) (3%) 統計量與抽樣分配 (statistics and sampling distribution)

2. 兩隨機變數 X 與 Y 的聯合機率密度函數為 $f(x,y) = cx, 0 < x < 1, 0 < y < 1 - x$

(a) (3%) c 值應為多少？

(b) (5%) 計算 $P(X + Y > 2/3 \mid X < 1/4)$

(c) (10%) X 與 Y 的相關係數為何？如何解釋 X 與 Y 的關聯性？

3. (5%) X 與 Y 為兩任意連續型隨機變數，證明 $E(X+Y) = E(X) + E(Y)$。

4. (6%)一卜式過程(Poisson process)單位時間的事件發生率為 λ，若兩相鄰事件發生間隔時間為隨機變數 Y，請用卜式分配推導出 Y 的機率密度函數(p.d.f.)。

5. 分析計算以下問題：

(a) (5%) 某批零件生產 20 件，其中 3 件為不良品，若隨機抽 5 件檢查，會查到不良品的機率為何？查到不良件數的期望值與變異數各為何？

(b) (5%) 擲一對骰子 10 次，超過一次以上骰子和出現為 7 的機率為何？

(c) (6%) 擲一對骰子 100 次，不到二十次骰子和出現為 7 的機率為何？

6. (20%) 收集某工作流程改善前後之數據如下表，假設改善前後之數據均符合常態分配，在α=0.10 下，請問這工作流程改善前後是否有差異?

改善前	17	11	14	13	16	14	18	17	13	16	15
改善後	8	12	11	7	8	10	9	11	13	12	11

國立雲林科技大學
99學年度碩士班暨碩士在職專班招生考試試題

系所：工管所、資管系
科目：統計學(1)

7.分別收集五臺機具四個相同時段的生產量，機具 A 為 850、850、900、1130，機具 B 為 300、600、450、750，機具 C 為 700、750、870、900，機具 D 為 770、550、620、930，機具 E 為 750、810、1250，1030。假設前述資料符合變異數分析的各項假設，$\alpha=0.05$。

(a) (10%) 請檢定五臺機具的生產量是否有差異。

(b) (12%) 若四個時段的數據中，前兩個時段為日班的生產量，後兩個時段為夜班的生產量，在此情況下，請檢定五臺機具的生產量是否有差異。

(c) (8%) 請說明比較(a)與(b)後的結論。

國立雲林科技大學

99 學年度碩士班暨碩士在職專班招生考試試題

系所：工管所、資管系

科目：統計學(1)

Table A.3 *(continued)* **Areas Under the Normal Curve**

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9278	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998

Table A.4 *Critical Values of the t-Distribution*

	α						
ν	0.40	0.30	0.20	0.15	0.10	0.05	0.025
1	0.325	0.727	1.376	1.963	3.078	6.314	12.706
2	0.289	0.617	1.061	1.386	1.886	2.920	4.303
3	0.277	0.584	0.978	1.250	1.638	2.353	3.182
4	0.271	0.569	0.941	1.190	1.533	2.132	2.776
5	0.267	0.559	0.920	1.156	1.476	2.015	2.571
6	0.265	0.553	0.906	1.134	1.440	1.943	2.447
7	0.263	0.549	0.896	1.119	1.415	1.895	2.365
8	0.262	0.546	0.889	1.108	1.397	1.860	2.306
9	0.261	0.543	0.883	1.100	1.383	1.833	2.262
10	0.260	0.542	0.879	1.093	1.372	1.812	2.228
11	0.260	0.540	0.876	1.088	1.363	1.796	2.201
12	0.259	0.539	0.873	1.083	1.356	1.782	2.179
13	0.259	0.537	0.870	1.079	1.350	1.771	2.160
14	0.258	0.537	0.868	1.076	1.345	1.761	2.145
15	0.258	0.536	0.866	1.074	1.341	1.753	2.131
16	0.258	0.535	0.865	1.071	1.337	1.746	2.120
17	0.257	0.534	0.863	1.069	1.333	1.740	2.110
18	0.257	0.534	0.862	1.067	1.330	1.734	2.101
19	0.257	0.533	0.861	1.066	1.328	1.729	2.093
20	0.257	0.533	0.860	1.064	1.325	1.725	2.086
21	0.257	0.532	0.859	1.063	1.323	1.721	2.080
22	0.256	0.532	0.858	1.061	1.321	1.717	2.074
23	0.256	0.532	0.858	1.060	1.319	1.714	2.069
24	0.256	0.531	0.857	1.059	1.318	1.711	2.064
25	0.256	0.531	0.856	1.058	1.316	1.708	2.060
26	0.256	0.531	0.856	1.058	1.315	1.706	2.056
27	0.256	0.531	0.855	1.057	1.314	1.703	2.052
28	0.256	0.530	0.855	1.056	1.313	1.701	2.048
29	0.256	0.530	0.854	1.055	1.311	1.699	2.045
30	0.256	0.530	0.854	1.055	1.310	1.697	2.042
40	0.255	0.529	0.851	1.050	1.303	1.684	2.021
60	0.254	0.527	0.848	1.045	1.296	1.671	2.000
120	0.254	0.526	0.845	1.041	1.289	1.658	1.980
∞	0.253	0.524	0.842	1.036	1.282	1.645	1.960

國立雲林科技大學

99學年度碩士班暨碩士在職專班招生考試試題

系所：工管所、資管系

科目：統計學(1)

Table A.6* Critical Values of the F-Distribution

$f_{0.05}(v_1, v_2)$

v_2	v_1 = 1	2	3	4	5	6	7	8	9
1	161.4	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
120	3.92	3.07	2.68	2.45	2.29	2.17	2.09	2.02	1.96
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

*Reproduced from Table 18 of *Biometrika Tables for Statisticians*, Vol. 1, by permission of E. S. Pearson and the Biometrika Trustees.

Table A.6 (continued) Critical Values of the F-Distribution

$f_{0.05}(v_1, v_2)$

v_2	v_1 = 10	12	15	20	24	30	40	60	120	∞
1	241.9	243.9	245.9	248.0	249.1	250.1	251.1	252.2	253.3	254.3
2	19.40	19.41	19.43	19.45	19.45	19.46	19.47	19.48	19.49	19.50
3	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
4	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.36
6	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
11	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
13	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
14	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
15	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
16	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
17	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
18	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
19	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
21	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
23	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
24	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
26	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
27	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
28	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
29	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
30	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62
40	2.08	2.00	1.92	1.84	1.79	1.74	1.69	1.64	1.58	1.51
60	1.99	1.92	1.84	1.75	1.70	1.65	1.59	1.53	1.47	1.39
120	1.91	1.83	1.75	1.66	1.61	1.55	1.50	1.43	1.35	1.25
∞	1.83	1.75	1.67	1.57	1.52	1.46	1.39	1.32	1.22	1.00

國立雲林科技大學
99學年度碩士班暨碩士在職專班招生考試試題

系所：資管系
科目：資訊管理導論

◎ **Essay questions part I: (10% each)**

1. A business perspective on information systems can be described as "Business Information Value Chain," explain the major business processes, information processing activities, and management activities involved in this value chain.

2. Why do some firms obtain greater value from their information systems than others? Based on resource perspective of MIS, comment on the complementary assets required for information technology to create sustainable competitive advantages for businesses.

3. Define IT infrastructure ecosystem; describe its major components and their contemporary trends.

4. Based on the example of customer decision support system (CDSS), describe main components of a DSS and the way DSS provide value for a business.

5. Identify the principle risk factors in information systems projects; suggest appropriate strategies for managing project risk and system implementation.

◎ **Essay questions part II:**

6. How attitudes toward inter-organization relationship establishment affect the willingness to share knowledge and how this association is affected by the control over resources and use of resources? Describe a theoretical model from four or five conceptions as followings （20%）and future research （5%）.

   a. Power Symmetry
   b. Relational Benefits
   c. Dysfunctional Conflict
   d. Relational Proclivity
   e. Connectedness
   f. Relational Risk
   g. Loss of Competences

7. To the best of your knowledge and practices, construct a new evaluation model for the general evaluation problem of the critical strategy which can facilitate a successful enterprise resource planning systems implementation for enabling the goal alignment between the project team and the organization.（25%）

國立雲林科技大學
99學年度碩士班暨碩士在職專班招生考試試題

系所：資管系
科目：資料結構(2)

1. 給一個 n 元素的陣列 A，內存 0 或 1 的鍵值。(a) 設計一個有效的演算法排序 A 陣列，讓所有 0 值在陣列內都排在 1 前面。只能使用 A 陣列本身，不能再額外使用其他陣列。請以虛擬碼呈現演算法，演算法的時間複雜度越低越好。並舉例且輔以圖示簡略說明你的演算法之運作 (10%) (b) 分析你的演算法的時間複雜度。(10%)

2. A **deque** is a data structure consisting of a list of items, on which the following operations are possible:

   push(x): Insert item x on the front end of the deque.
   pop(): Remove the front item from the deque and return it.
   inject(x): Insert item x on the rear end of the deque.
   eject(): Remove the rear item from the deque and return it.

   Write routines in pseudo-code to support the deque that take O(1) time per operation. (16%)

3. Describe, in pseudo-code, an algorithm for computing the number of descendents of each node of a binary tree. (14%)

4. Transform the following predicate calculus into the prefix form: (10%)

   $\neg x \wedge y \vee \neg y \wedge z \vee x \wedge \neg z$

5. Consider a sequence of keys: 1, 2, 3, 4, 5, 6, 7, 8, 9. Please draw the result by inserting these keys successively into an empty

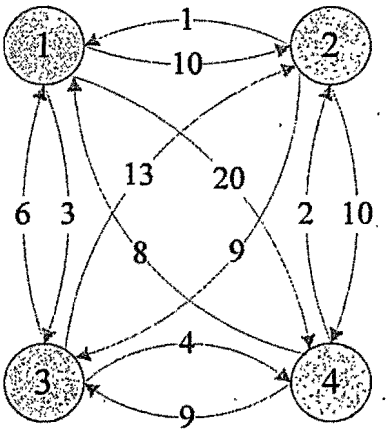
   (1) binary search tree (5%)
   (2) AVL tree (5%)
   (3) 2-3 tree (5%)

6. The recursive function G listed below is implemented in C programming language. What is the returning value of G(15, 6)? Why? (10%)

```
int G(int m, int n)
{
return((m%n == 0) ? n : G(n, m%n));
}
```

國立雲林科技大學 系所：資管系
99學年度碩士班暨碩士在職專班招生考試試題 科目：資料結構(2)

7. 給定一個有向網路圖如下所列，請以演算法計算出下圖任意兩頂點間之最短距離，並寫出演算的過程。(15%)



國立雲林科技大學
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系所：資管系
科目：計算機概論(3)

單選題，每題2分，共100分。

1. Switches are called Layer _____ devices.
   (A) 1 (B) 2 (C) 3 (D) 4
2. Ethernet uses a(n) _____ topology.
   (A) bus (B) mesh (C) extended star (D) point-to-point
3. Which 802 Working Group creates security standards?
   (A) 802.1 (B) 802.3 (C) 802.11 (D) 802.16
4. Bluetooth offers a rated speed today of about _____.
   (A) 3 Mbps (B) 11 Mbps (C) 22 Mbps (D) 54 Mbps
5. In the mask 255.255.128.0, how many 1s are there?
   (A) 16 (B) 17 (C) 18 (D) 19
6. A TCP _____ segment is a request to open a connection.
   (A) SYN (B) ACK (C) Open (D) Connect
7. _____ is used for supervisory messages at the internet layer.
   (A) TCP (B) DNS (C) DHCP (D) ICMP
8. Unsolicited commercial e-mail is _____.
   (A) spam (B) adware (C) identity theft (D) social engineering
9. The most popular client-side scripting language is _____.
   (A) PHP (B) ASP.NET (C) JavaScript (D) VBScript
10. As a process executes, it changes state. Which of the following is not a process state?
    (A) New (B) Save (C) Ready (D) Waiting
11. _____ is a graphical language that allows people who design software systems to use an industry-standard notation to represent them.
    (A) ERD (B) DFD (C) SQL (D) UML
12. The _____ program combines the output of the compiler with various library functions to produce an executable image.
    (A) editor (B) linker (C) loader (D) preprocessor
13. For a local variable in a function to retain its value between calls to the function, it must be declared with the _____ storage-class specifier.
    (A) auto (B) extern (C) static (D) register
14. ____ is a software stack for mobile devices that includes an operating system, middleware and key application.
    (A) Mac OS (B) Windows 7 (C) OpenVMS (D) Android

15. _____ is a group of interrelated web development techniques used on the client-side to create interactive web application.
(A) Ajax (B) CGI (C) Java Server Pages (D) .NET Framework

16. _____ are frequently used to model the processing requirements for most new systems.
(A) Organization diagrams (B) Data model diagrams
(C) Data flow diagrams (D) Connectivity diagrams

17. _____ are used during requirements elicitation and analysis to represent the functionality of the system.
(A) class diagrams (B) statechart diagrams
(C) activity diagrams (D) use case diagrams

18. _____ is the study of a current business and information system application and the definition of user requirements and priorities for a new or improved application.
(A) System planning (B) Systems analysis
(C) Systems design (D) Systems Implementation

19. _____ files are XML-formatted text files that reside in Web site's root directory and typically specify configuration setting for the site.
(A) Setenv.aspx (B) Global.asax (C) Aspnet.ini (D) Web.config

20. _____ is a process improvement approach that provides organizations with the essential elements of effective processes that ultimately improve their performance.
(A) SCMP (B) OOSE (C) CMMI (D) RARD

21. _____ is a free social networking and micro-blogging service that allows users to send updates through short messages or links, which can be up to 140 text characters in length.
(A) Plurk (B) Firefox (C) Stimator (D) BitComet

22. Which of the following is the category that includes individuals who sell products or services to organizations, as well as individuals who seek sellers, interact with them, and conclude a transaction?
(A) B2C (B) C2C (C) C2B (D) B2B

23. _____ describes a new supplement, consumption and delivery model for IT services based on Internet, and it typically involves the provision of dynamically scalable and often virtualized resources as a service over the Internet.
(A) Grid computing (B) Cloud computing
(C) Parallel computing (D) Mobile computing

24. Objects have the property of _____ — although objects may know how to communicate with one another across well-defined interfaces, they normally are not allowed to know how other objects are implemented.
(A) information hiding (B) inheritance
(C) polymorphism (D) overloading

25. Which of the following is true?
(A) The address operator & can be applied only to constants and to expression.
(B) A pointer that is declared to be of type void * can be dereferenced.
(C) Pointers of different types can never be assigned to one another without a cast operation.
(D) Pointer can be assigned to one another if both pointers are of the same type.

26. What is the computational complexity when solving the traveling salesman problem via brute-force search?
(A) O(n) (B) $O(n^2)$ (C) $O(n^3)$ (D) O(n!)

27. What is an algorithm which employs a degree of randomness as part of its logic?
(A) output-sensitive algorithm (B) deterministic algorithm
(C) empirical algorithm (D) probabilistic algorithm

28. Which one of the followings is *not* a classification algorithm?
(A) C4.5 (B) ID3 (C) CHAID (D) DEFLATE

29. Which one of the following abstract data types retains the input order?
(A) list (B) bag (C) set (D) map

30. What is an algorithm that can process its input piece-by-piece in a serial fashion, i.e., in the order that the input is fed to the algorithm, without having the entire input available from the start?
(A) offline algorithm (B) online algorithm
(C) adaptive algorithm (D) stable algorithm

31. Which one of the followings is a link-state routing protocol?
(A) IGRP (B) EGP (C) OSPF (D) BGP

32. Which one of the followings is *not* a property of a database transaction?
(A) atomic (B) consistent (C) isolated (D) distributed

33. Which one of the following normal forms is defined by "every non-trivial multi-valued dependency in the table is a dependency on a superkey"?
(A) 4NF (B) BCNF (C) 3NF (D) 2NF

34. Which one of the followings is often used to implement the dimensional model on top of the relational model?
(A) tree schema (B) star schema
(C) sun schema (D) moon schema

35. Which one of the followings is *not* a data manipulation language in SQL?
(A) insert (B) update (C) create (D) delete

36. Which one of the followings is *not* a referential action in SQL?
(A) CASCADE (B) RESTRICT (C) NO ACTION (D) TRIGGER

37. Which one of the followings is *not* a relational algebra operator?
(A) EXECUTE (B) RENAME (C) DIVISION (D) SELECTION

38. What is an entity that cannot be uniquely identified by its attributes alone?
(A) string entity (B) weak entity
(C) regular entity (D) foreign entity

39. What is a class that cannot be instantiated?
(A) inner class (B) concrete class
(C) abstract class (D) anonymous class

40. What is the act of casting a reference of a base class to one of its derived classes?
(A) inheritance (B) polymorphism (C) upcasting (D) downcasting

41. What is the relationship where one object belongs to another object and behaves according to the rules of ownership?
(A) has-a (B) is-a (C) associate with (D) comply with

42. What is an object that allows a programmer to traverse through all the elements of a collection, regardless of its specific implementation?
(A) index (B) iterator (C) reference (D) generator

43. Which one of the followings is *not* a mechanism of process synchronization?
(A) semaphore (B) mutex (C) vector (D) monitor

44. Which one of the followings does *not* use the stub/skeleton approach?
(A) RPC (B) DCE (C) RMI (D) DES

45. Which one of the followings is generally *not* a feature of a message-oriented middleware?
(A) synchronous delivery (B) persistent storage
(C) message routing (D) message transformation

46. What is the classification of array processors according to Flynn's taxonomy?
(A) SISD (B) SIMD (C) MISD (D) MIMD

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99學年度碩士班暨碩士在職專班招生考試試題 科目：計算機概論(3)

47. Which one of the followings is an ontology language?
(A) IDL (B) ALGOL (C) OWL (D) ML

48. What is the field of management that focuses on establishing and maintaining consistency of a system's or product's performance and its functional and physical attributes with its requirements, design, and operational information throughout its life?
(A) network management (B) program management
(C) model management (D) configuration management

49. What is a physical infrastructure through which Internet service providers (ISPs) exchange Internet traffic between their networks?
(A) Internet exchange point (B) domain name registrar
(C) proxy server (D) Internet gateway

50. What is the length of an IPv6 address?
(A) 64 bits (B) 128 bits (C) 256 bits (D) 512 bits