國立雲林科技大學
九十學年度研究所碩士班入學考試試題

系所：企管系、資管所
科目：統計學

壹、是非題(40%)

(本大題以扣分計算，答錯一題扣 4 分，未作答者扣 2 分，最多扣 40 分。)

(　) 1.設 A 與 B 爲兩個非空集合的事件，則 A 與 B 不可能同時爲互斥與獨立事件。

(　) 2.已知 A 與 B 爲獨立事件，且 $P(A)=0.3$，$P(B)=0.5$；則 $P(\overline{A}\cap\overline{B})=0.35$，其中 $\overline{A}$ 與 $\overline{B}$ 代表 A 與 B 的互補事件(complementary event)。

(　) 3.若事件 A 與 B 爲獨立，則 $Cov(A,B)=0$；反之亦然。

(　) 4.已知一組資料的平均數、中位數與眾數分別爲 2、5、7；則此組資料的分配呈左偏。

(　) 5.設 X 與 Y 皆爲隨機變數，則條件期望值 $E(X|Y)$ 爲 Y 的函數。

(　) 6.從一堆彩券抽獎，其中 m 張有獎，n 張無獎；若採抽出後不放回，則先抽與後抽之中獎機率相同。

(　) 7.已知 X 爲常態分配，其平均數與標準差分別爲 μ、σ；若 $P(x>a)=P(x<b)$，則 $\mu=\frac{1}{2}(a-b)$。

(　) 8.設 $\hat{\theta}_1$ 與 $\hat{\theta}_2$ 皆爲 θ 的估計量，已知 $\hat{\theta}_1$ 與 $\hat{\theta}_2$ 的期望值分別爲 2、3，且變異數分別爲 4、2；若假定 θ 的真實值爲 2，則 $\hat{\theta}_1$ 是 θ 的相對有效估計量。

(　) 9.自一母體(其標準差爲 σ)抽出一組隨機樣本(樣本數爲 n)，若 s^2 爲樣本變異數，則 $(n-1)\frac{s^2}{\sigma^2}$ 爲卡方分配。

(　)10.分層隨機抽樣中，分層的原則是「層內同質，層間異質」。

(　)11.設 $Z_i(i=1,2)$ 爲標準常態分配，則 Z_1^2/Z_2^2 爲卡方分配。

(　)12.自常態母體(平均數爲 μ，標準差 σ)抽出一組隨機樣本(n=10)，已知樣本平均數 $\bar{x}$ 的標準誤爲 1，若欲將標準誤減爲 $\frac{1}{2}$，則 n 應爲 40。

(　)13.母體平均數的信賴區間在其他條件不變下，若增加樣本數，則信賴區間長度愈長。

(　)14.其他條件不變下，信賴區間愈長，則準確度愈高。

(　)15.設有一檢定 $H_0:\mu\geq 3$，若真實的 μ 值由左方愈趨近 3，則其檢定力愈高。

( )16.同 15 題，在 t-檢定中，若 t-值愈大，則 p-值愈小。

( )17.同 15 題，當 n=10 時拒絕 H_0，則 n=20 時亦將拒絕 H_0。

( )18.在完全隨機設計的一因子變異數分析中，若該因子含有 3 種處理水準(level)，則此時亦可採用 2 個虛擬變數的迴歸分析。

( )19.設 R^2 與 $\overline{R}^2$ 分別爲迴歸分析的複判定係數與調整後的複判定係數，則 R^2 會隨著自變數個數增加而增加，但 $\overline{R}^2$ 則未必。

( )20.設 X,Y,Z 皆爲隨機變數，$\gamma_{X,Y,Z}$ 表固定 Z 之下的偏相關係數，而 $\gamma_{X,Y}$ 則爲相關係數；若 $\gamma_{X,Y,Z}$ 很低而 $\gamma_{X,Y}$ 很高(皆達顯著水準)，則謂 X 與 Y 爲虛假相關。

貳、 填空題(10%，每格 1 分)

1. 設有二個因子 A 與 B，A 因子有 3 種處理水準，B 因子有 2 種處理水準，且每種處理水準下皆有 2 個實驗單位，請完成下列的 ANOVA 表：

變異來源	平方和	自由度	均方 (Mean Square)	F 值
A	1742	(2)	(6)	F_1 = (9)
B	3	(3)	(7)	
交互作用	(1)	(4)	(8)	F_3 = (10)
誤差		(5)	7.667	
總和	1809			

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參、計算與簡答 (50%)

1. Suppose X is distributed N(4, 16), (a) if P(-X>k)=0.01, please find k ? [10%]
   (b) if P(|X-4|>f)=0.5, please find f ? [10%]

2. Suppose the following model is fitted by using a data set with size n

$$Y=\beta_0+\beta_1 X+\beta_2 W+\beta_3 Z+e$$

Where $W=\begin{cases}1 & if\ 1\le i\le k\\ 0 & otherwise\end{cases}$, $Z=\begin{cases}1 & if\ k<i\le m<n\\ 0 & otherwise\end{cases}$

(a) If consider W and Z are dummy variables, how many models are represented by the model above, please write down all of them? [15%]

(b) Illustrate the relationships among these models? [15%]

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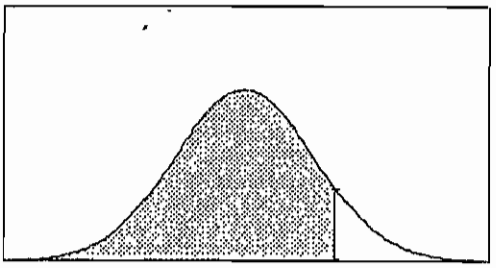
表 1.常態分配表

$$\Phi(z) = P(Z \le z) = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} dt$$



z

	z 的小數點第二位									
z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
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	0.9279	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
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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9. 數學計算式 A / B ** C * D + E (優先次序：** > *, / > +, -)，以下何者正確？
   (A) Prefix：+ * / ** A B C D E　　(B) Prefix：+ * / A B ** C D E
   (C) Postfix：ABCDE ** / * +　　(D) Postfix：ABC ** / D * E +

10. 下列有關 Binary Tree 之敘述何者不正確？
   (A) A binary tree is a finite set of nodes which is either empty or consists of a root and two disjoint binary trees
   (B) A full binary tree of depth k is a binary tree of depth k having $2^{k-1} - 1$ node
   (C) For any nonempty binary tree, T, if n0 is the number of terminal nodes and n2 is the number of nodes of degree 2, then n0 = n2 + 1
   (D) A binary tree with n nodes and of depth k is complete iff its nodes correspond to the nodes which are numbered one to n in the full binary trees of depth k

11. 目前主流資料庫的結構是下列哪種類型？
   (A) Hierarchical　(B) Network　(C) Relational　(D) Object-Oriented

12. 下列何者不是作業系統主要的功能？
   (A) 程式管理　(B) CPU 管理　(C) 磁碟管理　(D) 記憶體管理

13. 下列的敘述何者不正確？
   (A) 目前硬碟的空間大多以 GB 爲單位
   (B) Parity Check 可以更正資料的錯誤
   (C) 在電腦內中文以 2 個 byte 儲存
   (D) 目前的個人電腦是屬於 CISC 的架構

14. 下列的敘述何者不正確？
   (A) DVD-ROM 的容量比 CD-ROM 的容量大好幾倍
   (B) 檔案是由許多記錄所組成的
   (C) 微處理器可擴充 RAM 來加快其處理速度
   (D) 電腦中常用的進位有 2 進位及 16 進位

15. 下列有關資料庫的敘述何者不正確？
   (A) 使用資料庫比檔案較易保持資料的一致性
   (B) 資料儲存在資料庫比檔案好
   (C) SQL 可以存取資料庫中之資料
   (D) DBMS 支援 DDL 與 DML 的操作

16. 以下有關功能式程式設計（functional programming）的陳述，何者爲真？
   (A) 只有功能式的程式語言才能撰寫功能式的程式。
   (B) 以 C 語言撰寫功能式的程式可以變動全域變數 (global variable) 的值。
   (C) 功能式程式可以使用 loop-control variable 來控制迴圈的結束。
   (D) 功能式程式主要是透過函數間 (function) 參數值的傳遞來完成運算。

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17. 以下有關程式語言變數 (variables) 的陳述，何者爲假？
(A) Java 語言也可以讓程式設計師，獲得變數的地址。
(B) C 語言中變數的型態若使用錯誤，編譯器不一定會在 compile-time 產生錯誤信息。
(C) C 語言提供程式設計師獲得變數地址的功能。
(D) Perl 語言變數的型態在使用前不需要宣告。

18. 以下有關物件導向程式設計（object-oriented programming）的陳述，何者爲真？
(A) 物件導向的程式中不容許有同名的方法 (methods)。
(B) 只有物件導向程式語言可以有 operator overloading 的功能。
(C) 動態連結 (dynamic binding) 是一個與方法呼叫 (method call) 有關的觀念。
(D) 儲存物件的變數的型態必須事先宣告，而且在程式執行中不得更動。

19. 以下有關程式語言記憶體管理的觀念何者爲真？
(A) 提供自動記憶體管理機制的程式語言，不會出現誤用指標的錯誤。
(B) 支援自動化記憶體管理的程式語言必須要求程式設計師先宣告變數的型態。
(C) C 語言不提供程式設計師管理記憶體的機制。
(D) 程式執行時所用到的堆疊 (stack) 不被 garbage collector 所管理。

20. 以下有關程式語言的觀念何者不真？
(A) 要求使用者宣告變數型態的程式語言，執行的效率較高。
(B) 要求使用者宣告變數型態的程式語言，比較節省記憶體。
(C) C 語言的編譯器，可以找到所有關於型態 (type) 誤用的錯誤。
(D) C 語言支援 static binding 的功能。

21. 以下有關網路程式設計的陳述，何者爲真？
(A) HTTP 是一個也可以儲存瀏覽器端狀態的協定。
(B) C++語言不能撰寫 CGI 的程式。
(C) CGI 程式的輸出必須符合 HTML 的語法規定。
(D) HTML 內嵌式程式語言是透過連接於 HTTP 伺服器內的解譯器執行。

22. 以下有關 Linux 系統或公開原始碼軟體的陳述，何者爲真？
(A) Perl 是一個亦可在 Win32 平台執行的開放原始碼程式語言。
(B) GPL 是 Linux 系統使用的一個程式圖書館。
(C) Linux 的開發人員需要固定的集會，以討論系統的問題與解決方法。
(D) gcc 是一個視窗介面工具。

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一、單選題 (每題 2 分 共 60 分)

1. 一個小型的區域網路使用下列哪一項設備來連接最簡單且省錢？
   (A) Router (B) Switch (C) Hub (D) Repeater
2. 以下哪種安全機制，常用來防止全球資訊網瀏覽器資料傳送過程中被不當的擷取？
   (A) SET (B) SSL (C) PKI (D) Firewall
3. 下列哪一種技術是屬於瀏覽器端的技術？
   (A) DHTML (B) ASP (C) PHP (D) JSP
4. 若申請有五個固定 IP 的 ADSL 線路時，子網路罩應設爲多少?
   (A) 255.255.255.0 (B) 255.255.255.128
   (C) 255.255.255.192 (D) 255.255.255.248
5. C 語言之函數 fun1 之定義如下：

```
int fun1(int n)
{
  if (n == 0)
    return(2);
  else
    if (n == 1)
      return(1);
    else
      return(2 * fun1(n-1) + 3 * fun1(n-2));
}
```

   試問 fun1(5) = ?
   (A) 87 (B) 143 (C) 181 (D) 217
6. 在 C 語言之 int a, *b, **c, d[5], *e[5]; 宣告下，下列用法何者正確？
   (A) *e[2] = a; (B) *b = 3; (C) a = **c; (D) b = d;
7. 假設一二維陣列 A[10][5]，陣列元素大小爲 4，其起始位置 febc，註標是從 0 開始，在 row major 情況下。試問下列哪一個陣列元素的位址是正確？
   (A) A[2][4] = fef2 (B) A[5][2] = ff24 (C) A[7][3] = ff54 (D) A[9][1] = ff70
8. 下列有關資料結構之敘述何者正確？
   (A) 處理數學方程式時常用 Linked List 來儲存數學方程式的次方及係數
   (B) 作業系統中排程常用 Stack 來達成
   (C) 程式執行時函數呼叫常用 Queue 來完成
   (D) 動態空間分配常用 Tree 來完成

23. 以下哪個功能的執行一定需要瀏覽器的配合？
(A) Session
(B) Cookie
(C) Database access
(D) Generate HTML

24. 以下有關 Java abstract class 的觀念何者爲真？
(A) abstract class 不可以有方法 (method) 的定義
(B) abstract class 不可以宣告物件變數 (instance variable)
(C) abstract class 不可以產生物件 (instances)
(D) abstract class 也可以是 final class.

25. 以下有關 Java class variable 的觀念何者不真？
(A) class variable 是用 static 這個保留字來宣告的。
(B) 分配給物件的記憶體，也儲存著 class variable 的值。
(C) 一般的方法也可以存取 class variable 的值。
(D) 一個 public 的 class variable 可以說是一個 global variable。

26. 以下有關作業系統的觀念，何者不真？
(A) LIFO 是一種適合 process scheduling 的資料結構。
(B) 虛擬記憶 (virtual memory) 需要磁碟機的空間才能實現。
(C) context switch 是支援分時 (time sharing) 的必要功能。
(D) Linux 與 NT 都支援分時與虛擬記憶的功能。

27. 以下有關組合語言的觀念何者不真？
(A) 組合語言是計算機軟硬體間的主要介面。
(B) Java 編譯器最後也是產生組合語言的程式碼。
(C) 組合語言不直接支援函數 (functions) 的定義及呼叫。
(D) 組合語言有直接讀取微處理器中暫存器 (registers) 的功能。

28. 以下有關常規表示法（regular expression）的陳述，何者不真？
(A) 程式語言中用來規定變數名稱的寫法規定是一種常規表示法。
(B) 程式語言中用來規定數字的寫法規定也是一種常規表示法。
(C) 一個常規表示法可以用狀態轉換圖表達 (state transition diagram)。
(D) 常規表示法規定了程式語言的邏輯運算式的寫法規則。

29. 以下有關抽象式資料型態（abstract data type）的陳述，何者不真？
(A) 抽象式資料型態是一種建構資料結構的方法。
(B) 抽象式資料型態的使用者，可以透過公開的介面 (interface)，使用其資料結構。
(C) 抽象式資料型態建構其資料結構的方法可以改變，但是使用它的程式需要修改，否則無法正常運作。
(D) C 語言也可以撰寫抽象式資料型態。

30. 以下有關 C 語言的陳述，何者不真？
(A) C 語言是一個支援傳值呼叫（call-by-value）的程式語言。
(B) C 語言也支援傳址呼叫（call-by-reference）。
(C) C 函數 (functions) 的參數與區域變數的記憶體會自動的利用堆疊 (stack) 產生與消除。
(D) extern 的使用與 linker 無關。

二、問答題 (40 分)

1. 何謂 EC、B2B、B2C？試舉出目前應用 B2B、B2C 的企業或網站各 2 個。 (10 分)

2. 在系統開發過程中，首先需取得系統需求，然後做系統分析與系統設計的工作。試簡述二種較常用系統分析的方法。 (10 分)

3. HTML 內嵌式網路程式語言如 ASP 與 PHP 是目前開發網路程式的主流。試從程式語言與軟體開發的觀點簡要說明 HTML 內嵌式網路程式語言的缺點。 (5 分)

4. 試以 C、Java、Perl 中的任一種語言撰寫一個程式。這個程式有內建的姓名與密碼的資料結構。當使用者從 stdin 輸入一個姓名後，程式就把相對應的密碼印出，若沒有該姓名的資料則印出「找不到」，程式持續的可以讓使用者查詢密碼的資料，直到使用者輸入 999 爲止。請注意程式語法與邏輯等各方面的細節，錯誤愈少，愈接近能執行的程式，分數愈高。請將以下的資料存在資料結構中，不可以只用條件判斷式將資料內建於程式碼內。 （15 分）

Name:	Password:
Mary	Dog_and_cat
Peter	Simon
Paul	Rome
Tim	Borther

國立雲林科技大學
九十學年度研究所碩士班入學考試試題

系所：資管系
科目：資訊管理實務

一、選擇題(單選) 50% (每題 2 分) (答錯不倒扣)

1) All of the following are possible steps in the data collection and information gathering process that leads to decision making, except:
   a) classification.
   b) removal.
   c) summarizing.
   d) storing.
   e) retrieval.
2) Which of the following is the type of decision made by lower-level managers and staff for the day-to-day operations of an organization?
   a) structured.
   b) semistructured.
   c) unstructured.
   d) all of the above
   e) none of the above
3) According to Moore's law, processing power:
   a) doubles every 12 months.
   b) doubles every 18 months.
   c) triples every 12 months.
   d) triples every 18 months.
   e) triples every 24 months.
4) A dentist can have many patients but each patient has only one dentist. What kind of relationship is this an example of?
   a) one-to-one relationship
   b) one-to-many relationship
   c) many-to-many relationship
   d) all of the above
   e) none of the above
5) Which of the following represents data using two-dimensional tables?
   a) hierarchical data model
   b) network data model
   c) relational data model
   d) all of the above
   e) none of the above

6) Which of the following describes a telecommunication network that allows direct computer-to-computer exchange of business documents?
   a) ring topology
   b) electronic data interchange
   c) peer-to-peer relationship
   d) all of the above
   e) none of the above

7) A factory's computer automatically sending an order to a supplier's computer over a VAN is an example of which kind of EC?
   a) business-to-business
   b) business-to-business/individual
   c) individual-to-Individual
   d) all of the above
   e) none of the above

8) In which of the following is the data input device directly linked to the transaction processing system enabling the data to be processed as soon as they are generated?
   a) on-line transaction processing (OLTP)
   b) batch processing
   c) knowledge management
   d) all of the above
   e) none of the above

9) Which of the following is true of management information systems?
   a) Summary and exception reports are their most common input.
   b) Summary and exception reports are their most common output.
   c) Their main output targets are the transaction processing systems.
   d) all of the above
   e) none of the above

10) Which of the following constitute the three main components of a DSS?
   a) a TPS, a network, and a model management system
   b) a network, a model management system, and support tools
   c) a DBMS, a network, and support tools
   d) a DBMS, a model management system, and support tools
   e) none of the above

11) Which of the following is a reason that organizations outsource?
   a) To provide improved job security for its employees.
   b) Because prototyping is useful for building systems with emerging technology or in cases where the requirements aren't clear.
   c) To gain a strategic edge in the marketplace and better focus on its primary line of business.
   d) all of the above
   e) one of the above

12) The SDLC phase that follows systems planning is?
   a) systems implementation and evaluation
   b) systems design
   c) systems development
   d) systems analysis
   e) systems action

13) An example of a tangible factor for a systems project is?
   a) a workforce reduction of 30 people
   b) improving overall customer service
   c) enhancing the organization's image
   d) all of the above
   e) none of the above

14) Which of the following is the commonly accepted term for the person who is responsible for the entire IT division or department?
   a) chief data officer
   b) chief knowledge officer
   c) chief information officer
   d) chief computer officer
   e) chief engineering officer

15) The first step in selecting a software package is to
   a) develop a prototype
   b) identify potential software vendors
   c) evaluate software package alternatives
   d) evaluate the information system requirements
   e) negotiate with dealers

16) _____ software is a software package that can be used by many different types of organizations.

a) Commercial application
b) Horizontal application
c) Vertical application
d) In-house
e) EUC

17) A _____ is used to connect two similar networks.

a) router
b) bridge
c) gateway
d) modem
e) none of the above

18) Focusing on a niche means

a) providing products for a specific market segment.
b) being the low cost leader.
c) using computers better than competitors.
d) producing goods faster than competitors.
e) none of the above

19) A shoe company has a sophisticated and costly marketing information system in place that lets it sell products faster than anyone else. This would be a(n) _____ to a new business trying enter the market.

a) competitive reduction
b) switching cost
c) barrier to entry
d) barrier to exit
e) none of the above

20) Looking for patterns in a data warehouse is called

a) exception reporting
b) coursing
c) desynchronization
d) data mining
e) none of the above

21) Which of the following is responsible for budget, time, and people in application development?

a) business technologist
b) programmer
c) systems analyst
d) project manager
e) knowledge manager

22) Which of the following are support value chain activities?

a) Human resource management
b) Operations
c) Firm infrastructure
d) a and c
e) a and b

23) Access, FoxPro, and Paradox are examples of which type of software?

a) word processing
b) CAD
c) Charting
d) Databases
e) Spreadsheets

24) Which of the following is a reason that intra-organizational systems are used more frequently today?

a) Intra-organizational systems act as a storage unit for information within one company site.
b) As globalization continues at an accelerated pace, managers are under pressure to quickly access, digest, and disseminate large volumes of information across national and international boundaries.
c) As the cost of hardware increases, the cost of building intra-organizational systems continues to decrease.
d) all of the above e) none of the above

25) Which of the following is true regarding change?

a) Employees are generally very amenable to change, which is a great help in implementing new programs and initiatives.
b) Change can be avoided.
c) Resistance to change is one of the major obstacles in implementing new programs and initiatives.
d) Change is easy.
e) none of the above

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二、申論題（共二題，每題二十五分）

1. 請回答下列有關知識管理的問題。盡量以實例說明！（25% ）
   (1) 何謂知識管理？
   (2) 知識管理的核心是什麼？
   (3) 組織在進行知識管理有何前提必備的條件？
   (4) 組織如何進行知識管理？
   (5) 組織如何如何評估知識管理的成效？

2. 印度的資訊軟體產業發展相當成熟，廣爲歐美國家代工撰寫程式，如同晶圓代工爲台灣賺取巨額外匯一般，印度的資訊軟體產業也爲印度賺取巨額外匯。試論本土的資訊軟體產業應如何迎頭趕上？有關政府部門應該如何配合？學界又應如何配合？（25% ）

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科目：資訊管理導論

1. What is the difference between a data-driven DSS and a model-driven DSS? Give examples. [10%]

2. How can companies use information systems to promote knowledge management? [20%]

3. What advantage does an artificial neural system have over a conventional expert system? [20%]

4. Please distinguish between operational databases, data warehouse, and marketing data mart from the following perspectives: (1) purpose (2) structure (3) data type (4) data quality (5) event trigger [25%]?

5. Why is EDI moving from VANs to the Internet [7%]? What are some of the limitations of such a move [8%]? In what ways can VAN and Internet EDI complement each other [10%]?

國立雲林科技大學
九十學年度研究所碩士班入學考試試題

系所：資管系
科目：計算機概論 (甲)

單選題 （第一部份） 70% (各小題 2 分，答錯不倒扣)

1. Which of the following is true?
   (A) In IP spoofing, the attacker interchanges the source and destination addresses in the sender's IP datagram.
   (B) Nonce's are often used to combat the playback attack.
   (C) For public-key certification, PGP (Pretty Good Privacy) uses certification authorities.
   (D) The AH (Authentication Header) protocol provides secrecy at the network layer.

2. Which of the following is true?
   (A) CRC (Cyclic Redundancy Checks) error detection, as used in Ethernet, is always able to detect whether there is an error in a frame.
   (B) The even parity bit scheme can correct single bit errors.
   (C) PPP (Point-to-Point Protocol) excludes certain bit patterns in the network-layer packets that it carries.
   (D) Consider a router with multiple ARP (Address Resolution Protocol) tables, one for each of its interfaces. No two of these ARP tables can contain the same LAN address.

3. Which of the following is true?
   (A) Host A is sending host B a large file over a TCP connection. Assume host B has no data to send A. Host B will not send acknowledgements to host A because B cannot piggyback the acknowledgements on data.
   (B) The size of the TCP `RcvWindow` never changes throughout the duraing of the connection.
   (C) Suppose host A is sending host B a large file over a TCP connection. The number of unacknowledged bytes that A sends cannot exceed the size of the receiver buffer.
   (D) Suppose host A is sending host B a large file over a TCP connection. If the sequence number for a segment of this connection is m, then the sequence number for the subsequent segment will necessarily be $m + 1$.

4. Which of the following statements about SMTP (Simple Mail Transfer Protocol) is false?
   (A) The client SMTP authenticates the sender before sending a message.
   (B) The client SMTP has TCP establish a connection on port 25 to the server SMTP.
   (C) The body of each SMTP message ends with "CRLF . CRLF," where CR and LF stand for carriage return and line feed, respectively.
   (D) SMTP uses persistent connection.

5. Which of the following is true?
   (A) In the BGP (Border Gateway Protocol) routing algorithm, each autonomous system advertises to its neighbors its estimates of the shortest distances from the autonomous system to all possible destination autonomous systems.
   (B) OSPF (Open Shortest Path First) uses BGP for routing among areas.
   (C) A gateway router must run both an intra-autonomous system routing algorithm and an inter-autonomous system routing algorithm.
   (D) Every autonomous system must use the same intra-autonomous system routing algorithm.

6. Which of the following is true?
   (A) With ADSL, each subscriber gets more downstream bandwidth than upstream bandwidth.
   (B) The Internet provides its applications two types of services, a TDM service and a FDM service.
   (C) Before sending a packet into a datagram network, the source must determine all of the links that packet will traverse between source and destination.
   (D) Twisted-pair cooper wire is no longer present in computer networks.

7. Given two relations R(A, B) = $\{(a_1, b_1), (a_2, b_1), (a_3, b_1), (a_4, b_1), (a_1, b_2), (a_3, b_2), (a_2, b_3), (a_3, b_3), (a_4, b_3), (a_1, b_4), (a_2, b_4), (a_3, b_4)\}$, S(A) = $\{(a_1), (a_2), (a_3)\}$, what is the result of R ÷ S?
   (A) $\{(b_1), (b_3)\}$
   (B) $\{(b_1), (b_4)\}$
   (C) $\{(b_2), (b_3)\}$
   (D) $\{(b_2), (b_4)\}$

8. Which of the following is not a property of database transactions?
   (A) Atomicity
   (B) Continuity
   (C) Durability
   (D) Isolation

9. Which of the following plays an important role in representing information about the real world in a database?
   (A) The query optimizer
   (B) The data manipulation language
   (C) The buffer manager
   (D) The data model

10. Which of the following is not a part of the ANSI/SPARC three-level architecture for a database?
   (A) The external schema
   (B) The logical schema
   (C) The presentation schema
   (D) The internal schema

11. The great majority of businesses have moved from mainframes and dumb terminals to
   (A) supercomputers.
   (B) personal digital assistants.
   (C) stand alone personal computers.
   (D) networked personal computers.

12. _____is the newest binary coding scheme, using 16 bits to represent each character.
   (A) ASCII
   (B) Unicode
   (C) EBCDIC
   (D) Monolith

13. _____is a new type of RAM memory chip that can retain data even when it loses power.
   (A) ROM
   (B) Cache RAM
   (C) Flash RAM
   (D) Zip RAM

14. In two-phase commit, the sequence of steps performed by the DBMS are as follows:
   (A) first check the readiness of the remote parts for transaction and then perform it.
   (B) first delete the local parts for transaction and then perform it.
   (C) first perform the transaction and then check for the readiness of parts to do it.
   (D) first check the readiness of the local parts for transaction and then perform it.

15. The term used to describe the connection of all the different networks in an organization is
   (A) peer-to-peer.
   (B) enterprise computing.
   (C) LAN.
   (D) Client/master.

16. IPIX is technology that enables users to
   (A) program robots with pseudo-natural language.
   (B) create video programs using computers.
   (C) design Web pages interactively.
   (D) view images in 3-D on a computer screen.

17. The newest and fastest form of data transmission architecture is
   (A) ISA
   (B) MCA
   (C) EISA
   (D) PCI

18. A new and rapidly evolving technology that uses existing telephone lines yet has a transfer rate like that of a T1 line is called _____.
(A) ISDN.
(B) microwave.
(C) cable modem.
(D) ADSL.

19. Which of the connection types listed below is fastest?
(A) Serial
(B) Parallel
(C) USB
(D) Cable

20. In the near future, _____technology will allow us to store many gigabytes of data in a space as small as a sugar cube.
(A) magneto-optical
(B) DVD-RW
(C) holographic
(D) super-conduction

21. In pipelining _____.
(A) several computers are connected; each computer performs one part of the machine cycle
(B) one instruction can be executed and stored while another is retrieved from RAM and decoded
(C) the microprocessors in the computer are aligned as if they were a long pipe
(D) all instructions are aligned in the CPU before being executed

22. Cache memory chips are faster than _____ memory.
(A) SRAM
(B) PRAM
(C) DRAM
(D) both a and c

23. Two of the properties that determine the power of a computer are
(A) the size of the computer and the size of the computer monitor.
(B) the size of the input devices and the speed with which information can be retrieved from memory.
(C) the computer's internal storage capacity and the speed with which stored information can be retrieved.
(D) the internal and external speed of the computer.

24. The two great advantages of using object-oriented programming languages are the
(A) easy understanding of the objective of the programs to be written, and the orientation in which the code is written.
(B) ease in determining the orientation of the code and the relative ease of learning the languages.
(C) emphasis that these languages put on the objects on which the written code is operating and the procedures of the individual language.
(D) ease of maintenance of written programs and the efficiency in application development.

25. Computer programs that can handle many different types of data in the form of text, pictures, sound, and animation are referred to as _____ applications.
(A) multimedia
(B) multipurpose
(C) visual basic
(D) animation

26. When using an application on the computer, "transparency" means that the
(A) user is not made aware of operations that are not directly related to what he or she wishes to do with the application.
(B) user is not aware of who wrote the application.
(C) user does not know what to expect from the application.
(D) computer monitor is clear enough to see the application's code.

27. What does "open source" mean in the context of software?
(A) The source of the software is unknown: nobody know who wrote the software.
(B) The software has never been put to productive use.
(C) There are many different versions of the software at any given time.
(D) The source code (code in the original programming language) is available to all to modify and improve.

28. Parallel transmission is the
(A) transmission from one computer to many computers at the same time.
(B) transmittal of every byte in its entirety.
(C) transmittal of one bit at a time through a single line.
(D) transmission of the same data both inside the computer and outside the computer, to another or second computer.

29. Data _____ is the scrambling of data at the transmitting end to minimize the risk that an unauthorized party will understand it, if it is intercepted.
(A) scrambling
(B) decryption
(C) encryption
(D) compression

30. _____ is expected to become the dominant communications standard of the future. Some experts predict that the protocol will eventually replace current protocols not only in WANs, but also in LANs.
(A) ISDN
(B) ATM
(C) Cellophone
(D) Teleconferencing

31. Java applets _____
(A) can run only on one operating system
(B) are embedded in pages' HTML code and are able to run on any computer regardless of which operating system is being used
(C) are applications that help produce HTML code
(D) are special applications that help manage servers connected to the Internet

32. In a(n) _____ database, different parts of the database are stored in the locations where they are accessed most often, but they continue to be fully accessible to others through telecommunications.
(A) emulated
(B) mimicked
(C) replicated
(D) fragmented

33. _____ is the organization of very large amounts of data in databases, usually relational databases, for efficient use.
(A) Mega databasing
(B) Data warehousing
(C) Data storing
(D) Data piling

34. The best known security standards for ISs are detailed in the
(A) operating system of each computer.
(B) Orange Book, which is a book published by the U.S. government and titled "Trusted Computer System Evaluation Criteria."
(C) A-D book, published by IBM.
(D) the Yellow Book, published by the FBI.

35. How does the callback security measure work?

(A) When a modem dials into a system, a special application asks for the telephone number from which the call has been made; if the number is authorized, the system disconnects and dials that number. If the number does not match a number on its list of authorized numbers, the system does not allow access.

(B) The system constantly calls telephone numbers to which users are remotely connected, until a user accepts a call and connects to the system.

(C) When a modem dials into a system, the system produces a message asking the user to dial again in a minute or two and, in the meantime, checks to see if the caller provided an appropriate combination of user ID and password.

(D) none of the above

單選題 （第二部份） 30% (各小題 5 分，答錯不倒扣)

36. Given a relation schema EMPLOYEE (FIRST_NAME, LAST_NAME, ID, BIRTH_DATE, ADDRESS, SEX; SALARY, DEPARTMENT), which of the following SQL statement is a correct expression of the query – "retrieve the name of each employee who has the same first name and same sex as another employee"?

(A)
```
SELECT    E1.FIRST_NAME, E1.LAST_NAME
FROM      EMPLOYEE E1
WHERE     E1.ID IN  (SELECT   E2.ID
                     FROM     EMPLOYEE E2
                     WHERE    E1.FIRST_NAME =
                              E2.FIRST_NAME
                              AND
                              E1.SEX = E2.SEX AND
                              E1.ID <> E2.ID);
```

```
(B) SELECT    E1.FIRST_NAME, E1.LAST_NAME
    FROM      EMPLOYEE E1
    WHERE     (SELECT   COUNT(*)
              FROM      EMPLOYEE E2
              WHERE     E1.FIRST_NAME = E2.FIRST_NAME
                        AND
                        E1.SEX = E2.SEX AND
                        E1.ID <> E2.ID) > 1;
(C) SELECT    E1.FIRST_NAME, E1.LAST_NAME
    FROM      EMPLOYEE E1
    WHERE     EXISTS (SELECT    'ID_NO'
                      FROM      EMPLOYEE E2
                      WHERE     E1.SEX = E2.SEX AND
                                E1.FIRST_NAME =
                                E2.FIRST_NAME
                                AND
                                E1.ID <> E2.ID);
(D) SELECT    E1.FIRST_NAME, E1.LAST_NAME
    FROM      EMPLOYEE E1
    WHERE     EXISTS (SELECT    *
                      FROM      EMPLOYEE E2
                      WHERE     E1.SEX = E2.SEX)
              AND
              EXISTS (SELECT    *
                      FROM      EMPLOYEE E3
                      WHERE     E1.FIRST_NAME =
                                E3.FIRST_NAME)
              AND
              EXISTS (SELECT    *
                      FROM      EMPLOYEE E4
                      WHERE     E1.ID <> E4.ID);
```

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系所：資管系
科目：計算機概論（甲）

37. Let $r_i[x]$ (or $w_i[x]$) denote the execution of a read (or write) issued by transaction T_i on data item x. Let c_i and a_i denote transaction T_i's commit and abort operations (respectively). Consider two transactions $T_1 = w_1[x]w_1[y]w_1[z]c_1$ and $T_2 = r_2[u]w_2[x]r_2[y]w_2[y]c_2$. Which of the following is a strict history?

(A) $w_1[x]w_1[y]r_2[u]w_1[z]c_1w_2[x]r_2[y]w_2[y]c_2$

(B) $w_1[x]w_1[y]r_2[u]w_2[x]r_2[y]w_2[y]c_2w_1[z]c_1$

(C) $w_1[x]w_1[y]r_2[u]w_2[x]r_2[y]w_2[y]w_1[z]c_1c_2$

(D) $w_1[x]w_1[y]r_2[u]w_2[x]w_1[z]c_1r_2[y]w_2[y]c_2$

38. If two transactions consist of 4 and 6 actions, respectively, how many interleavings of these transactions are there?

(A) 180 (B) 210

(C) 280 (D) 320

39. Suppose we have a file of 1,000,000 records that we want to hash into a table with 1,000 buckets. 100 records will fit in a block, and we wish to keep blocks as full as possible, but not allow to buckets to share a block. What is the maximum number of blocks that we could need to store this hash table?

(A) 8,960 (B) 9,740

(C) 10, 240 (D) 10,990

40. The TCP sequence number field has four bytes. Consider transferring an enormous file of L bytes from host A to host B. Assume a maximum segment size of 1460 bytes. What is the maximum value of L such that TCP sequence numbers are not exhausted?

(A) 4 Gbytes (B) 64 Gbytes

(C) 512 Gbytes (D) 5840 Gbytes

41. Suppose that 1000 multicast groups are on going at the same time and choose their IP multicast group addresses at random. What is the probability that they interfere with each other?

(A) 0.024 (B) 0.016

(C) 0.008 (D) 0.002

國立雲林科技大學
九十學年度研究所碩士班入學考試試題

系所：資管系
科目：資料結構

一、有一個二維陣列 A，假設 A(1, 1)的位址是 644 而 A(3, 3)的位址是 676 的話，請問 A(14, 14)的位址為何？請簡述您的答案。(10 分)

二、某個函數 Q 以遞迴的方式定義如下：

$$Q(a,b)=\begin{cases}0, & \text{若} a<b\\ Q(a-b,b)+1, & \text{若} a\geq b\end{cases}$$

1. 請求出 Q(100, 3)的值？(8 分)
2. 請描述 Q(a, b)函數的功能究竟為何？(12 分)

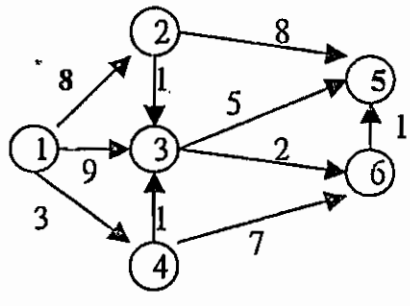
三、某個團體有 100 個成員，假設其中某一個人想將一件訊息發佈給其餘的 99 人，他的作法是首先打電話通知 99 人中的任意 2 個尚未接獲消息的成員，並告知每個聽到訊息的人，都應試著通知其它兩個尚未接獲消息的成員 (假設每個聽到訊息的人，均已清楚尚未接獲消息成員的名單)。請問

1. 總共至少要打幾通電話才能全部通知完畢？請簡述您的答案。(5 分)
2. 在此團體中有多少人不必打電話通知別人？請簡述您的答案。(5 分)
3. 若將上述問題一般化為 n 個成員，而傳遞消息時要試著打 m 通電話給其他尚未接獲消息的成員。請問前兩個小題的答案為何？(10 分)

四、假設有一資料數列如右：18 12 40 34 10 8 15 9 32 6，請依堆積排序的方式將上述資料作排序，並寫出其詳細的排序過程。(15分)

五、假設右列英文字母，其出現的頻率如右的話(N: 4, E: 17, W: 3, A: 22, B: 12, C: 11, D: 9，即 N 出現的次數為 4 次、E 出現的次數為 17 次、... D 出現的次數為 9 次)，請以 Huffman Code 的方式對上述的英文字母編碼，並畫出它的二元樹。(15 分)

六、請用Dijkstra的演算法(最小路徑尋找法)在下圖中，找出從節點①到其它各節點間的最小成本路徑，並寫出Dijkstra演算法的每個步驟之計算過程。(20分)



國立雲林科技大學
九十學年度研究所碩士班入學考試試題

系所：資管系
科目：離散數學

本試題計 10 題，每題 10 分，共 100 分。

1) Show that the set of all infinite strings (無窮字串) is an un-countable set (不可數集) .

2) If $x \equiv 2 \bmod 3$, $x \equiv 3 \bmod 5$, and $x \equiv 5 \bmod 7$, find the solution x between 200 and 300 .

3) Discuss the "Linear Array" , "Mesh Network" , and "Hyper cube Network"

4) a) Define K_5. b) Show that K_5 is Nonplanar (非平面圖) .

5) If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 1 & 0 \end{bmatrix}$, and $B = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}$, find the Boolean products of A * B and B * A .

6) Rewrite the following statements formally using quantifiers and variables :
a. Everybody loves somebody.
b. Somebody loves everybody.

7) Use mathematical induction to prove that $2 + 4 + 6 + \ldots + 2n = n^2 + n$, for all integers $n >= 1$.

8) Design a finite-state automation with input alphabet equal to {0, 1} that accepts the set of all strings for which the final three inputs symbols are 1.

9) Each of the following is a relation on {0, 1, 2, 3}. Draw directed graphs for each relation and indicate which relations are antisymmetric.
a. $R_1 = \{(0, 0), (0, 2), (1, 0), (1, 3), (2, 2), (3, 0), (3, 1)\}$
b. $R_2 = \{(0, 1), (0, 2), (1, 1), (1, 2), (1, 3), (2, 2), (3, 2)\}$

10) Proof the following theorem :
If k is a positive integer and T is a full binary tree with k internal vertices, then T has a total of $2k + 1$ vertices and has $k + 1$ terminal vertices.