考試科目	計算機概論	所別	資訊管理	考試時間	3月16日 星期日 第1節

1. Use the following list of values with length of list being 11. Show the state of the list when the first recursive call is made in Quicksort using list[0] as the split value. **(10%)**

[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
24	42	66	20	3	90	10	35	18	40	99

2. What is the difference between 1K of memory and 1K transfer rate. **(10%)**

Let the A register be the accumulator used to hold data and the results of operations. There are two bytes in the A register. The information shown in Table 1, Table 2, Figure 1, and Figure 2 are used in solving the following machine-language problems 3-5.

3. What are the content of the A register after the execution of the following two machine-language instructions? **(10%)**
   00001001 00000000 00000001
   00011000 00000000 00000001

4. What are the content of the A register after the execution of the following two machine-language instructions? **(10%)**
   00001000 00000000 00000001
   00011001 00000000 00000010

5. What are the content of the A register after the execution of the following two machine-language instructions? **(10%)**
   00001001 00000000 00000011
   00100001 00000000 00000010

Table 1. State of Memory. Each cell of memory has one byte.

Address	state of memory (in hexadecimal)
0001	A2
0002	11
0003	FF
0004	00

考試科目	計算機概論	所別	資訊管理	考試時間	3月16日 星期日 第 節

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Table 2. The subset of operation codes.

Operation code	Meaning of Instruction
00001	Load operand into the A register
00010	Store the contents of the A register into operand
00011	Add the operand to A register
00100	Subtract the operand from A register

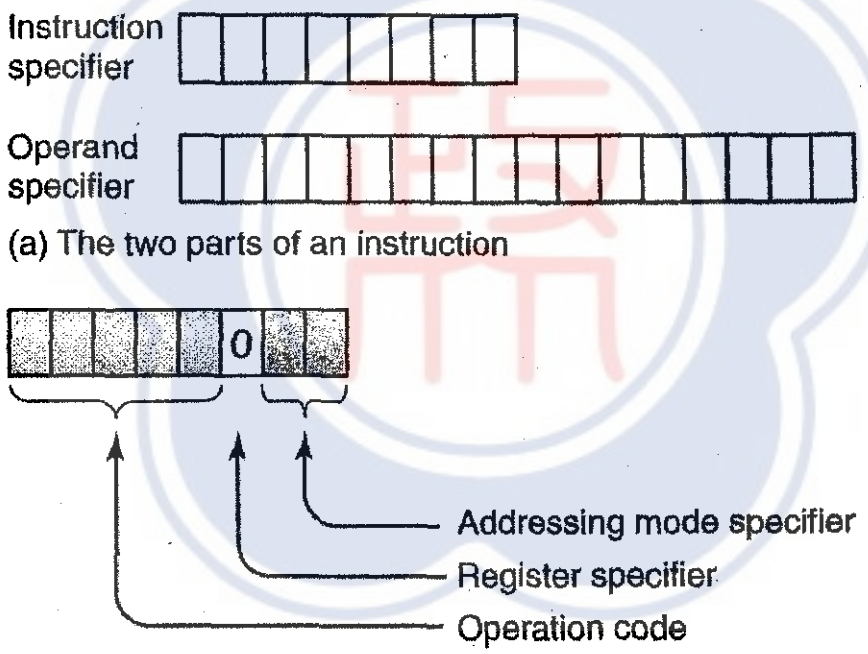

Figure 1. The format of a machine-language instruction. (a) There are two parts in the machine-language instruction. The first part is the 8-bit instruction specifier and the second part is the 16-bit operand specifier. (b) There are three sub-parts in the operand specifier. The first sub-part is the 5-bit operation code, the second sub-part is the 1-bit register specifier, which is always 0 here, and the third sub-part is the 2-bit addressing mode specifier.

考試科目	計算機概論	所別	資訊管理 416	考試時間	3月16日 星期日 第 節

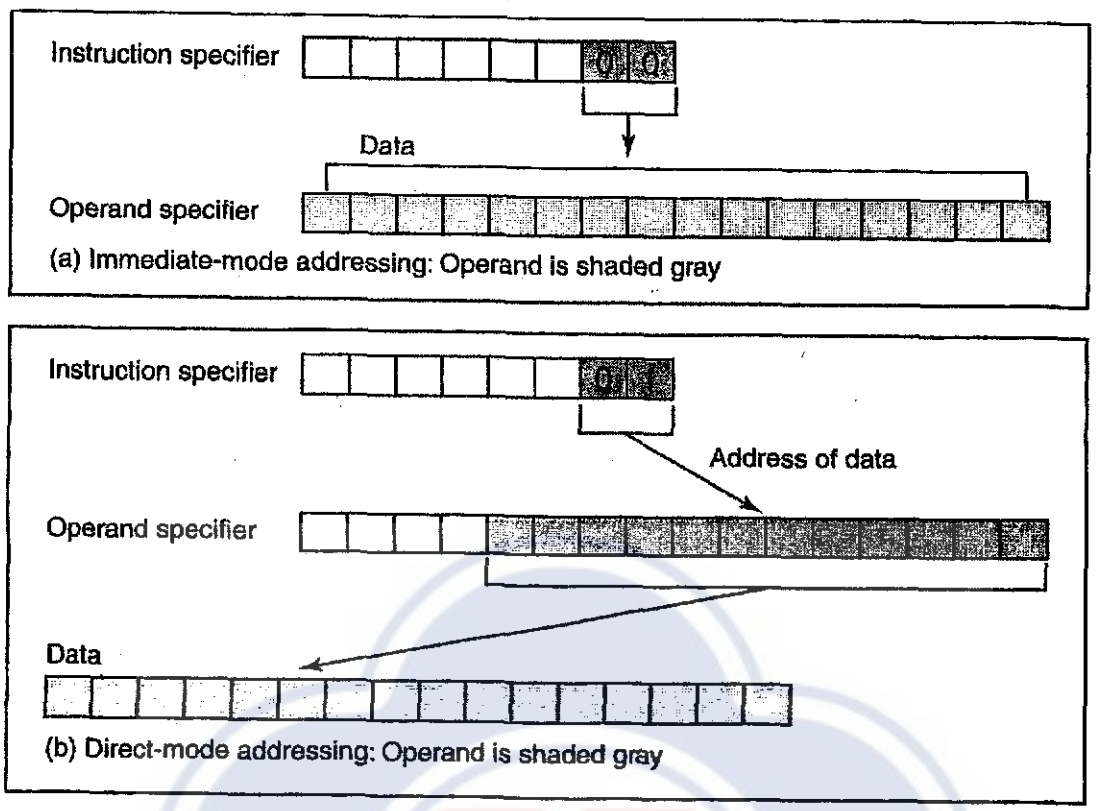

Figure 2. Two different addressing modes. If the addressing mode specifier is 00, the operand is in the operand specifier of the instruction. If the addressing mode specifier is 01, the operand is in the memory address named in the operand specifier of the instruction.

6. (30 points)

Consider the following recursive function

```
void f(int n)
{
  if (n == 0 || n == 1) { cout << n << '\n'; return; }
  f(n/2);
  f(n-n/2);
}
```

(a) What is the output after the invocation of f(2)?

(b) What is the output after the invocation of f(5)?

(c) What is the output after the invocation of f(2*k) with k a positive integer?

(d) What is the output after the invocation of f(2*k-1) with k a positive integer?

(e) What is the output after the invocation of f(-1)?

(f) Please modify the function so that function f won't cause (function) stack overflow problem.

7. (20 points)

(a)Describe the quick sort algorithm.

(b)Implement quick sort in C++.

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考試科目	管理資訊系統	所別	資訊管理學系 4161	考試時間	3月16日 星期 日 第三節

選擇題(每題三分)

1. An information system can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support:

a. decision making and control in an organization. b. communications and data flow.

c. managers analyzing the organization's raw data. d. the creation of new products and services.

2. Disciplines that contribute to the technical approach to information systems are:

a. computer science, engineering, and networking.

b. operations research, management science, and computer science.

c. engineering, utilization management, and computer science.

d. management science, computer science, and engineering.

3. The costs for firms operating on a global scale have been drastically reduced by:

a. networking technology. b. investments in organizational complementary assets.

c. the Internet. d. the rise of digital content.

4. An information system can enhance core competencies by:

a. providing better reporting facilities. b. creating educational opportunities for management.

c. allowing operational employees to interact with management.

d. encouraging the sharing of knowledge across business units.

5. Tools that record customer activities at Web sites and store them in a log for further analysis are called:

a. clickstream tracking tools. b. customer tracking tools.

c. collaborative filtering tools. d. filtering tools.

6. Net marketplaces:

a. focus on continuous business process coordination between companies for supply chain management.

b. operate as independent intermediaries between buyers and sellers.

c. are geared towards short-term spot purchasing.

d. are more relationship oriented and less transaction oriented than private industrial networks.

7. The set of business processes, culture, and behavior required to obtain value from investments in information systems is one type 0f :

a. knowledge culture. b. knowledge discovery.

c. organizational and management capital. d. organizational routine.

備考	試題隨卷繳交

命題委員： （簽章） 97 年 3 月 5 日

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考試科目	管理資訊系統	所別	資訊管理學系 4161	考試時間	3月16日 星期日 第三節

8. Virtual reality systems:

a. provide engineers, designers, and factory managers with precise control over industrial design and manufacturing.

b. provide an important source of expertise for organizations.

c. allow groups to work together on documents.

d. provide architects, engineers, and medical workers with precise, photorealistic simulations of objects.

9. GDSS are most useful for tasks involving:

a. session planning, organizational memory, personal productivity, and enterprise analysis.

b. idea generation, complex problems, and large groups.

c. idea generation, idea organization, prioritizing, and policy development.

d. session planning, prioritizing, policy development, and organizational memory.

10. Two of the management challenges in developing global systems are:

a. managing the privacy concerns of different countries and coordinating applications development.

b. creating a financial structure that will operate internationally and managing the privacy concerns of different countries.

c. agreeing on common user requirements and managing the privacy concerns of different countries.

d. coordinating of software releases and introducing of changes in business processes.

問答題(每題十分)

1. 資訊部門要達成資訊科技與業務的校準(alignment)並有效地使用資訊資源，應具備哪些功能，請由資訊部門所需要具備的功能流程說明之？
2. 資訊部門組織結構要如何設計才能同時滿足總部與分公司的各項資訊需求，請從極權與分權的角度來說明資訊部門組織要如何設計才能同時做到資訊資源的整合與差異化？
3. 資訊部門為促成企業流程與資料的整合和標準化，應定義什麼 IT 規範，請舉例說明？
4. 請說明入口網站、維基百科、社會網路書籤，以及學習管理系統對於推動知識管理所扮演的角色。
5. 什麼是公司能夠追求由資訊系統帶動的競爭策略？資訊系統如何支援這些競爭策略？請舉例說明。
6. 比較物件導向方法與傳統結構化方法在系統塑模與設計的不同處？並舉例說明各方法適用於哪種類型的企業資訊系統。
7. 何謂商業智慧(business intelligence)？何謂競爭智慧(competitive intelligence)？與資料庫科技有什麼關係？

備考	試題隨卷繳交

命題委員： （簽章） 97 年 3 月 5 日

命題紙使用說明：1.試題將用原件印製，敬請使用黑色墨水正楷書寫或打字（紅色不能製版請勿使用）。
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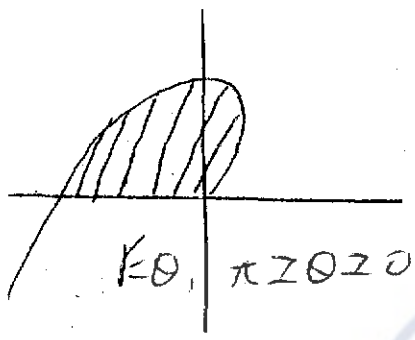
考試科目	微積分	所別	資管系 4161	考試時間	3月16日 星期日 第3節

1. Find the derivative. (20%)

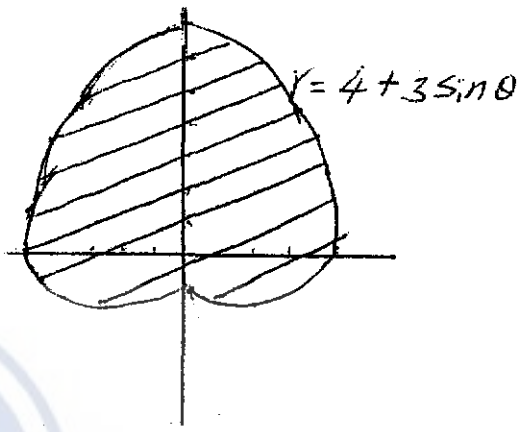
(a) $y = \sec\theta\tan\theta$ (b) $y = \theta\csc\theta - \cot\theta$

2. Find the area of the shaded region (20%)

a.



b.



3. Use multiplication of power series to find the first three nonzero terms in the Maclaurin series for each function. (20%)

a. $e^{-x^2}\cos x =$

b. $\dfrac{x}{\sin x} =$

4. Find the length of one circle of the cycloid $x = r(\theta - \sin\theta)$, $y = r(1-\cos\theta)$ (20%)

5. Use spherical coordinates to find the volume of the solid that lies above the cone $z = \sqrt{x^2+y^2}$ and below the sphere $x^2+y^2+z^2 = z$ (20%)