

國立中山大學 105 學年度碩士暨碩士專班招生考試試題

科目名稱：計算機概論【資管系碩士班】

題號：442001

※本科目依簡章規定「不可以」使用計算機(混合題)

共 4 頁第 1 頁

單選題 (60%)

1. Which of the following is a collection of data items organized as a set of formally-described tables from which data can be accessed or reassembled in many different ways without having to reorganize the database tables?
 - A. Relational database
 - B. Array
 - C. File allocation table
 - D. Splay tree
 - E. Venn diagram
2. The term _____ is used to describe a packet, frame, cell or other transmission unit that is too large in the networks.
 - A. Very large database
 - B. Holographic storage
 - C. Cold fusion
 - D. Giant
 - E. Electronic data interchange
3. Which is the capability of control the access of multiple threads to any shared resource?
 - A. Serialization
 - B. Synchronization
 - C. Internationalization
 - D. None of the above
4. Which is the layer of a computer system between the hardware and the user program?
 - A. Operating environment
 - B. Operating system
 - C. System environment
 - D. Database system
5. What is a standard interactive and programming language for getting information from and updating a database?
 - A. Dynamic data exchange
 - B. Structured Query Language
 - C. ASCII
 - D. Erlang programming language
 - E. WebLogic
6. Which is an implementation of the path vector protocol?
 - A. Border Gateway Protocol (BGP)
 - B. Routing Information Protocol (RIP)
 - C. Open Shortest Path First (OSPF)
 - D. None of these
7. Which is a connectionless, unreliable datagram protocol that is primarily responsible for addressing and routing packets between hosts?
 - A. IPv6
 - B. IPv4
 - C. Both IPv6 & IPv4
 - D. None of the above

試題隨卷繳回

背面有題

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共 4 頁第 2 頁

8. Which frames are used to transport user data and control information relating to user data (piggybacking)?
 - A. I-frames
 - B. S-frames
 - C. V-frames
 - D. None of the above
9. Which protocol is used for transmitting multiple streams of data at the same time between two ends points that have established a connection in a network?
 - A. UDP
 - B. SCTP
 - C. TCP
 - D. RIP
10. Which domain is used to map an address to a name?
 - A. Generic domains
 - B. Country domains
 - C. Inverse domain
 - D. None of the above
11. Which of the following best describes the NOR operation?
 - A. An XOR followed by a NOT
 - B. An OR followed by a NOT
 - C. A NOT followed by an OR
 - D. An AND followed by a NOT
12. Which of the following provides a compressed representation of an image by limiting the number of different pixel colors to 256, thereby enabling each pixel in an image to be represented by a single byte whose value indicates which of a palette of entries represents the pixel's color?
 - A. ASCII
 - B. MPEG
 - C. JPEG
 - D. GIF
13. An ARM based processor is an example of what kind of computer architecture?
 - A. x86
 - B. CISC
 - C. RISC
 - D. Pentium
14. Which of the following is a task that is not performed by the kernel of an operating system?
 - A. Communicate with the user
 - B. Schedule processes
 - C. Allocate resources
 - D. Avoid deadlock
15. Which of the following connects existing networks to form an internet?
 - A. Bridge
 - B. Router
 - C. Switch
 - D. Repeater

背面有題

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題號：442001

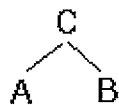
※本科目依簡章規定「不可以」使用計算機(混合題)

共 4 頁第 3 頁

16. Which of the following identifies the application to which a message arriving from the Internet should be given?
- A. Protocol
 - B. Port number
 - C. Domain
 - D. Hop count
17. The binary search algorithm is an example of an algorithm in which of the following classes?
- A. $\Theta(\log_2 n)$
 - B. $\Theta(n)$
 - C. $\Theta(n \log_2 n)$
 - D. $\Theta(n^2)$
18. Which of the following is not a step in the process of compiling a program?
- A. Executing the program
 - B. Parsing the program
 - C. Lexical analysis
 - D. Code generation
19. Which of the following is not associated with object-oriented programming?
- A. Inheritance
 - B. Resolution
 - C. Encapsulation
 - D. Polymorphism
20. The nodes in which of the trees below will be printed in alphabetical order by the following recursive procedure?

```
function printTree (Tree)
  if (Tree is not None)
    printTree(Tree.Left)
    printTree (Tree.Right)
    print(Tree.Value)
```

A. B. C.



問答題 (40%)

1. Consider the following JAVA code:

```
public interface Moveable{ void move();}

public abstract class Animal implements Moveable{
  private String name;
  public abstract void eat();
  public void move(){System.out.println("animal moves");}
  public void sleep(){..}
}

public class Mammal extends Animal{
  public void eat(){System.out.println("gimme meat!");}
  public void regulateTemperature(){..}
}
```

背面有題

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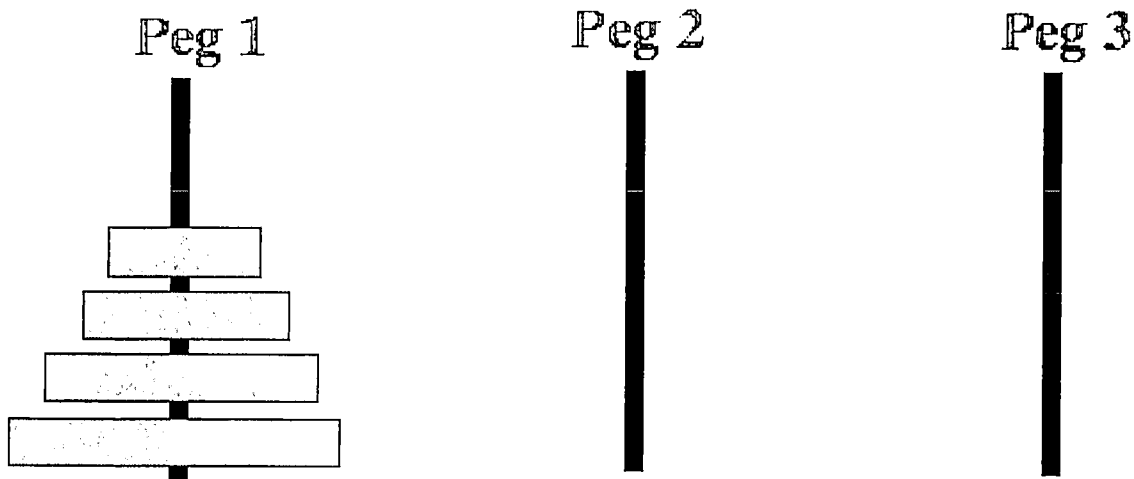
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共 4 頁第 4 頁

```
public class Human extends Mammal{
    public void think(){..}
    public void move(){System.out.println("human walks");}
}
```

- A. What is the result of executing the following code? (which eat() method will invoke or compiler error)
Movable m = new Mammal();
m.eat();
- B. What is the result of executing the following code? (which move() method will invoke or compiler error)
Animal a = new Human();
Movable m = a;
m.move();

2. Write the script to solve the Towers of Hanoi problem for 4 disks.
There are 3 pegs. There are 4 disks stacked on the first peg. (The disks has a hole in the center).
Please move the 4 disks from peg 1 to peg 3 and must obey a set of rules:
a) You can only move one disk at a time (from any peg to any other peg), and
b) You can not stack a smaller disk on top of a larger disk



3. Determine the number of non-negative integer solutions for $x_1 + x_2 + x_3 + x_4 + x_5 = 40$.
4. If we were using RSA encryption with the public keys $n = 91$ and $e = 5$, what would be the encrypted version of the message whose bit pattern is 11?

國立中山大學 105 學年度碩士暨碩士專班招生考試試題

科目名稱：英文【資管系碩士班甲組、乙組】

題號：442002

※本科目依簡章規定「不可以」使用計算機(選擇題)

共 6 頁第 1 頁

This examination consists of 50 questions, divided over 5 sections; 2 points for each correct answer.

I. Choose the right alternative

Instructions: The following 30 sentences form a story. Each of the sentences has a blank: choose the word that fits best in the blank. In your choice for the right answer, consider both grammatical correctness and the context of the story.

1. The following sentences tell the story of Jeanette and Norman, a young couple in the process of ____ love.
a. deep b. very much c. falling in d. feeling in
2. They are in many respects a ____ couple: their family backgrounds are quite similar, for instance.
a. well-liked b. well-respected c. well-matched d. well-seasoned
3. They met at an excellent business school, during an ____ couple of months when they worked on a project together.
a. intense b. intern c. intentional d. insubstantial
4. Norman remembers exactly when Jeanette first ____ him as a person he could love.
a. told b. considered c. liked d. struck
5. It was when, late one evening, her eyes lit up in ____ when she identified a miscalculation in their statistics that would have invalidated their research.
a. despair b. anger c. triumph d. disappointment
6. "How smart she is, and how beautiful," Norman thought. "This is the woman I ____ marry!"
a. ask to b. shall c. do d. consider
7. A sudden shyness, however, prevented Norman from expressing his feelings directly. ____, they had to spend hours now recalculating their findings and redoing their statistical analysis.
a. However b. First c. Therefore d. Besides
8. That night they burned the midnight oil together, ____ over their laptops.
a. hunched b. bending c. hovering d. hung

試題隨卷繳回

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共 6 頁 第 2 頁

9. But how good it felt when they _____ an A⁺ for their project by their professor!
a. got b. received c. obtained d. were given
10. A celebration was _____.
a. to have b. called for c. then d. deserving
11. Norman _____ a drink and a bite to eat at “The Factory,” an upscale bar.
a. decided b. ordered c. proposed d. liked
12. Jeanette, _____ with the idea, agreed to go there with Norman.
a. delighted b. exasperated c. enjoying d. accepting
13. “The Factory” was a large, airy place, soft music _____ from speakers in every corner.
a. blared b. throbbing c. whispered d. playing
14. They drank wine, _____ delicious Japanese delicacies, and talked about their future plans.
a. while eating b. and c. ate d. many
15. They discovered they had so much _____.
a. the same b. in common c. together d. identical
16. Both Jeanette and Norman were _____ to start their own businesses, for instance.
a. eager b. willing c. nearly d. also
17. And they both were _____ to the music of Taiwanese singer Cheer Chen (陳綺貞).
a. attractions b. attractive c. attracted d. attracting
18. “How smart Jeanette is, and how beautiful,” Norman thought _____.
a. now b. finally c. again d. at last
19. He drank more wine. He asked Jeanette if she wanted another drink, but she _____.
a. angry b. nodded c. declined d. hadn't

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共 6 頁第 3 頁

20. After gulping down another glass, Norman finally got up the _____ to ask Jeanette the question he had had on his mind.
a. impertinence b. idea c. plan d. courage
21. "How about going into business together?" _____, we work so well together.
a. Now that b. Since c. Because d. After all
22. "I think we would make a great team," he continued, "and not just in business. Why don't we _____ forces in life as well?"
a. share b. join c. exert d. provide
23. Jeanette, _____ gain some time to think, said: "Are you saying what I think you are saying?"
a. who b. instead of c. in order to d. by way of
24. Norman, who had switched to whiskey now, drained his glass and _____ said, "Yes."
a. had b. sadly c. sternly d. simply
25. Suddenly, Cheer Chen's music came on over the sound system of "The Factory." "How did you _____ that?" Jeanette, smiling, asked Norman.
a. find b. coincidence c. manage d. fabricate
26. "Cost me a bit of money," Norman answered, "but it was _____ it."
a. worth b. worthy c. worthwhile d. worthily
27. Jeanette liked Norman's adroitness as a suitor: it _____, she thought, to his entrepreneurial spirit.
a. testified b. showed c. revealed d. highlighted
28. "Yes, I want to go into business with you," she said. "And I'll _____ marrying you as well, on one condition, though."
a. want to b. happily go c. prefer d. consider
29. Norman, _____ nervously holding his newly-filled glass, asked: "What is your condition?"
a. while he b. his hand c. who d. being

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※本科目依簡章規定「不可以」使用計算機(選擇題)

共 6 頁 第 4 頁

30. "You'll have to stop drinking _____ you'll end up an alcoholic!"

- a. from now on b. too much c. alcohol d. or

II. Match verbs with phrases

Instructions: for phrases 31 –35, determine which verb from the box fits best. Use each verb only once.

a. limit b. dread c. employ d. induce e. rescind

31. To _____ caution

32. To _____ exposure

33. To _____ a coma

34. To _____ a law

35. To _____ a visit

III. Match nouns with phrases

Instructions: for phrases 36-40, determine which noun from the box fits best. Use each noun only once.

a. entrance b. advance c. clearing d. advice e. insult

36. A military _____

37. A _____ in the forest

38. Making quite an _____

39. Dubious _____

40. An angry _____

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題號：442002

※本科目依簡章規定「不可以」使用計算機(選擇題)

共 6 頁第 5 頁

IV. Match words with words of similar meaning

Instructions: Match the words in the box with the words 41-45 that come closest in meanings. Use each word only once.

a. blasé b. carnal c. aloof d. qualified e. blighted

41. conditional

42. bored

43. diseased

44. sensual

45. distant

V. Reading Comprehension

Instructions: Read the following texts and select the best answer to questions 46-50.

According to a survey, South Korean men use 13 grooming products on average a month, almost half the number that their female peers use (South Korean women follow multi-step skincare routines, involving cleansers, essences, and ampoules). Almost all big South Korean brands have men's lines. The country's male skincare market doubled in value from 2009 to 2014. Its men are the leading consumers of male cosmetics per capita (and buy four times more than the next-vainest, the Danes), making up one-fifth of worldwide sales.

On the face of it, such preening is at odds with South Korea's macho, socially conservative culture. Yet it is during their two-year military service that many men first dabble in make-up: girlfriends offer them camouflage face-paint kits, and moisturizers for the country's dry winters and sizzling summers.

(adapted from the December 5th 2015 issue of *The Economist*)

46. Per month, South Korean women use, on average,

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題號：442002

※本科目依簡章規定「不可以」使用計算機(選擇題)

共 6 頁 第 6 頁

a. about 25 grooming products

b. about half the number of grooming products that their male peers use

c. multi-step skincare, but also cleansers, essences, and ampoules

d. big Korean brands that also have men's lines

47. "The country's male skincare market doubled in value from 2009 to 2014." This means that

a. between 2009 to 2014, Korean men became bigger consumers of cosmetics than Korean women

b. the number of grooming products that Korean men used doubled in the period 2009-2014

c. Korean men came to spend twice as much money on skincare in 2014 than they did in 2009

d. the number of department stores that sold male skincare doubled in the period 2009-2014

48. According to the article, Korean men

a. account for 20% of male cosmetics sold in the world; this makes them the vainest men on earth

b. come only after the Danes, who are the next-vainest men in the world, in buying male cosmetics

c. buy four times as much Danish cosmetics as Korean, which makes up one fifth of their purchases

d. consume cosmetics per capita, which is four times cheaper than cosmetics are in Denmark

49. "On the face of it, such preening is at odds with South Korea's macho culture." This means,

a. it seems odd that Korean men pay such attention to facial care because it is such a macho culture

b. South Korea's macho culture explains the preening facial care of South Korean men

c. only Korean men who are not macho preen; this puts them at odds with macho Korean men

d. it is, at first sight, unexpected that South Korea's macho culture and male preening go together

50. Many South Korean men

a. begin using make-up during their military service: their girlfriends introduce them to useful items such as camouflage face-paint kits and moisturizers

b. reject the use of make-up at the beginning of their military service, but their girlfriends offer it to them as protection against the harsh climate

c. make a mess of their camouflage make-up in the beginning of their military service, but their girlfriends help them out by providing handy camouflage face-paint kits as well as moisturizers

d. practice using camouflage paint and moisturizers on their girlfriends before dabbling in it themselves

The End of the MA Entrance Exam

背面有題

國立中山大學 105 學年度碩士暨碩士專班招生考試試題

科目名稱：管理資訊系統【資管系碩士班甲組、乙組】

題號：442004

※本科目依簡章規定「不可以」使用計算機（問答申論題）

共1頁第1頁

1. (a) 由於數位化形式的產生，導致許多產品包括軟體、音樂、資訊等數位產品，改變了傳統的經濟法則。請從這些所謂的數位化產品的成本結構、產品特性及產品定價，探討數位化產品的新經濟法則。(7%)
(b) 相較於傳統產品，由於數位產品特性與成本結構的改變，在網路經濟體系內產生了新的市場供需現象與企業經營模式。這其中最著名的當屬長尾理論 (Long Tail，或稱長尾現象、長尾效應)，請舉一個你所知道的實例，說明何謂長尾理論。(8%)
2. (a) 電子商務是一個新的、虛擬化及全球化的市場，電子商務的市場運作，必須有其基本的基礎環境，例如促成交易的通路、市場、付款機制、相關法規、提供的產品與服務等，請說明電子商務環境的基本架構模式。(10%)
(b) 行動支付 (Mobile Payment) 是電子化付款的方式之一，請舉一行動支付平台為例，簡述其應用及優缺點。(10%)
3. 何謂供應鏈？何謂推式供應鏈 (Push) 及拉式供應鏈 (Pull)？推式及拉式供應鏈兩者的差別在哪？供應鏈管理中常提到的長鞭效應 (Bullwhip Effect)，又是代表什麼？(15%)
4. 何謂工業 4.0，請詳述他的主要的特性，以及其主要所使用的資訊科技。(25%)
5. 何謂共享式經濟 (Sharing Economy)？請舉例說明之，由於失敗的案例很多，並請說明這種經營模式最主要的關鍵成功要素是什麼？(25%)

試題隨卷繳回

國立中山大學 105 學年度碩士暨碩士專班招生考試試題

科目名稱：資料結構【資管系碩士班乙組】

題號：442003

※本科目依簡章規定「不可以」使用計算機(混合題)

共 3 頁 第 1 頁

單選題

1. (3%)

Which of the following statements about stacks is INCORRECT?

- (a) stacks cannot be implemented using linked lists.
- (b) new nodes can only be added to the top of the stack.
- (c) stacks are “last in first out” (LIFO) data structures.
- (d) values are added and removed only from one end.

2. (3%)

Suppose you have a list of file names sorted in alphabetical order and stored in one of the following data structures. The easiest way to print the names in reverse alphabetical order would be to use a

- (a) binary search tree
- (b) stack
- (c) queue
- (d) linked list

3. (4%)

Suppose you have a non-empty linked list implemented in C with pointers. Which of the following C code should appear in a function that adds a node to the end of the linked list? Assume *newPtr* is a pointer to the new node to be added, and *lastPtr* is a pointer to the current last node. Each node contains a pointer *nextPtr*, which is a link to a node.

- (a) `lastPtr = newPtr;`
`lastPtr->nextPtr = newPtr;`
- (b) `newPtr->nextPtr = lastPtr;`
`lastPtr = newPtr;`
- (c) `lastPtr = newPtr;`
`newPtr->nextPtr = lastPtr;`
- (d) `lastPtr->nextPtr = newPtr;`
`lastPtr = newPtr;`

問答題

4. (10%)

Write a C-like recursive function *reverse(string)* that prints reversed string of a given string. For example, *reverse(“string”)* would print “gnirts”. Please DO NOT use any string manipulation functions.

5. (5%)

Please construct a Binary Search Tree from the following sequence of numbers.

27, 13, 42, 6, 17, 33, 48

6. (10%)

What are the pre-order, in-order, and post-order traversals of your tree for Question 5? Please write down the

試題隨卷繳回

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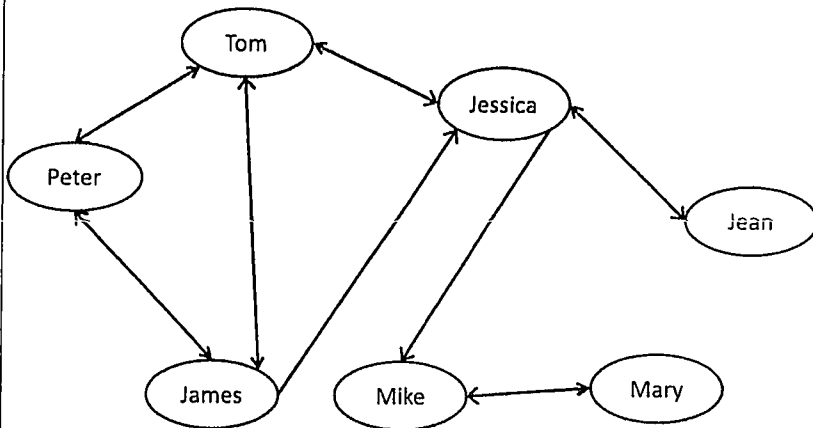
sequences of the numbers.

7. (5%)

Below is a small social network represented by nodes and arrows as people and the kinds of connections respectively, where

“ $A \rightarrow B$ ” denotes “A knows B, but B does not know A” .

“ $A \leftrightarrow B$ ” denotes “A and B know each other.” .



Assume that one person can only know at most five people. Please define your own self-referential data structure that represents a node with the arrows in the network.

8. (10%)

According to the above network, do you think that Mary has chance to know Tom via her social network? Please help Mary by writing a C-like function *would_A_know_B*(A, B) to check whether A may know B.

9. (10%)

Assume that array A contains 10 elements, which are 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20. Trace the following procedure and indicate how many steps in the repeat-until loop are required to find the numbers 1, 3, 13, and 21? (hint: in the procedure, $n = 10$, and x is the number to find)

```

    i = 1; j = n;
    repeat k = (i + j) / 2
      if A(k) ≤ x then i = k + 1
      else j = k - 1
    until i > j
  
```

10. (15%)

Ackerman's function $A(m, n)$ is defined as below:

$$A(m, n) = \begin{cases} n + 1 & \text{if } m = 0 \\ A(m - 1, 1) & \text{if } n = 0 \\ A(m - 1, A(m, n - 1)) & \text{otherwise} \end{cases}$$

(a) What is the value of $A(2, 1)$? (5%)

(b) Write a recursive program to calculate $A(m, n)$. (10%)

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11. (15%)

- (a) For a graph $G = (V, E)$, $V = \{0, 1, 2, 3, 4, 5, 6\}$, $E = \{(0, 1), (0, 2), (0, 7), (1, 2), (2, 3), (2, 7), (3, 4), (3, 5), (3, 7), (4, 5), (5, 6), (6, 7)\}$, and the cost for above edges are $\{13, 16, 27, 11, 20, 22, 19, 18, 29, 15, 26, 11\}$, respectively. Use Kruskal's algorithm to find the minimal cost spanning tree and give the cost of the tree you derive. (5%)
- (b) Write a procedure to detect a cycle for the above algorithm. (10%)

12. (10%)

Analyze the time required (time complexity) for the worst-case and the average-case in bubble sort.