

國立中正大學

113 學年度碩士班招生考試

試題

[第 1 節]

科目名稱	計算機概論
系所組別	資訊管理學系- 甲組 乙組
	資訊管理學系醫療資訊管理

—作答注意事項—

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科目名稱：計算機概論

系所組別：資訊管理學系-甲組、乙組

資訊管理學系醫療資訊管理

[Section I] Multiple Choice (70 points)

Choose ONE answer only for each question (2 points for each question)

1. The binary representation of 28-10 is:

- A. 10000 B. 10001 C. 10010 D. 10011

2. The binary notation of 66.375 is:

- A. 1000100.111 B. 1000100.101 C. 1000010.101 D. 1000010.011

3. Which of the following has the lowest access speed?

- A. main memory B. hard disk C. cache D. register

4. The technique to consolidate multiple signals into a single composite signal is called:

- A. multiplexing B. pipelining C. multiprocessing D. multitasking

5. The following processes arrive for execution at the times indicated. Each process will run the listed amount of time. Suppose the non-preemptive shortest job first (SJF) scheduling algorithm is used, what is the average waiting time for these processes?

Process	Arrival Time	Burst Time
P1	0	8
P2	1	5
P3	2	2

- A. 4.67 B. 5.00 C. 5.33 D. 5.67

6. Following the question above. What is the average turnaround time for these processes?

- A. 9.00 B. 9.33 C. 9.67 D. 10.00

7. Which of the following has the worst space efficiency?

- A. RAID 0 B. RAID 1 C. RAID 3 D. RAID 5

8. Each time the dispatcher awards a time slice to a process, it initiates a timer circuit that will indicate the end of the slice by generating a signal called:

- A. interrupt B. signaling I/O C. deadlock D. spinlock

9. How many IP addresses are in a class B network?

- A. 254 B. 256 C. 65534 D. 65536

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科目名稱：計算機概論

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系所組別：資訊管理學系-甲組、乙組

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10. Which of the following connects two bus networks?

- A. switch B. access point C. repeater D. all of the above

11. Which of the following refers to a small piece of data sent from a website and stored on the user's computer by the user's web browser while the user is browsing so as to remember stateful information?

- A. etag B. proxy C. cookie D. register

12. The application layer protocol of LINE is:

- A. HTTP B. SMTP C. SNMP D. VoIP

13. Which of the following is polynomially bounded?

- A. $100^{\log n}$ B. 2^n C. n^n D. all of the above

14. The worst time complexity of quick sort is:

- A. $O(n)$ B. $O(n \log \log n)$ C. $O(n \log n)$ D. $O(n^2)$

15. The average time complexity of insertion sort is:

- A. $O(n \log \log n)$ B. $O(n \log n)$ C. $O(n^2)$ D. $O(n^2 \log n)$

16. What is the printed value of the following code?

```
sum=0;
for(int i=1; i<=8; ++i)
    sum+=i;
cout << sum << endl;
```

- A. 32 B. 36 C. 0 D. 40320

17. What is the value of arr[5] of the following code?

```
int arr[10];
for(int i=0; i<10; ++i)
    arr[i]=0;
for(int i=0; i<10; ++i)
    if (i==5)
        continue;
    arr[i]=i*i;
```

- A. 0
B. 5
C. 25

D. 36

18. What is the printed value of the following code?

```
int arr[10];
for(int i=0; i<10; ++i)
    arr[i]=i*i;
    if(i%3==1)
        cout << arr[i] << " ";
    if(i==5)
        break;
cout << endl;
```

A. 1 16

B. 0 1 4 9 16

C. 1 16 49

D. 0 1 4 9 16 25 36 49 64 81

19. ____ allows one class to encompass the properties of another.

A. encapsulation B. polymorphism C. inheritance D. interface

20. The way to give the function direct access to the actual parameters by telling it the addresses of the actual parameters in the calling program unit is called ____.

A. call by value

B. call by reference

C. fruitful function

D. all of the above

21. A problem occurred during a program's execution is called ____.

A. compile error B. syntax error C. exception D. none of the above

22. Given $T(n)=2T(n/2)+1$, $T(0)=0$, $T(1)=1$, $T(n)=?$

A. $\Theta(\log n)$ B. $\Theta(n)$ C. $\Theta(n \log \log n)$ D. $\Theta(n \log n)$

23. Given $T(n)=2T(n/2)+\log n$, $T(0)=0$, $T(1)=1$, $T(n)=?$

A. $\Theta(\log^2 n)$ B. $\Theta(\log n \log \log n)$ C. $\Theta(n)$ D. $\Theta(n \log n)$

24. Which of the following has the lowest complexity?

A. 100!

B. $2^{\log n}$

C. n

D. $4^{\log n}$

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系所組別：資訊管理學系-甲組、乙組

資訊管理學系醫療資訊管理

25. Given a binary search tree. The inorder and postorder traversal of this tree are 1,3,5,7,9,11,13 and 1,5,3,7,13,11,9, respectively. What is the preorder traversal of this tree?
A. 9,7,3,1,5,13,11
B. 9,7,3,1,5,11,13
C. 9,7,3,5,1,13,11
D. 9,7,3,1,5,11,13
26. Given a binary tree with 16 nodes, and it has 3 nodes with degree 1. How many leafs in this tree?
A. 5 B. 6 C. 7 D. 8
27. In the relational database, a column in a relation is called _____.
A. dictionary B. item C. tuple D. attribute
28. Which of the following extracts columns from a relation?
A. SELECT B. PROJECT C. CHOOSE D. JOIN
29. Which of the following is not an animation software?
A. 3ds Max B. TensorFlow C. Maya D. all of the above
30. The ____ model is a RNN model.
A. LSTM B. VGG16 C. FaceNet D. actor-critic
31. The ____ model is not for reinforcement learning.
A. GRU B. DQN C. DDPG D. PPO
32. Which of the following is not a branch of machine learning?
A. unsupervised learning
B. particle swarm optimization
C. reinforcement learning
D. all of the above
33. Which of the following is a non-computable problem?
A. traveling salesman problem
B. clique problem
C. subset sum problem
D. halting problem

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34. Which of the following is a NP-complete problem?

- A. depth-first-search problem
- B. spanning tree problem
- C. all-pairs-shortest-path problem
- D. 0/1 knapsack problem

35. Which of the following is not a NP-complete problem?

- A. all-pairs-shortest-path problem
- B. 0/1 knapsack problem
- C. traveling-salesman problem
- D. clique problem

[Section II] Problems and Calculations (30 points)

1. Convert the Hexadecimal number $(6F)_{16}$ into the following carry number:

- (a) (3 pts) Octal number
- (b) (3 pts) Decimal number

2. (6 pts) Please use the do-while loop in C/C++ to calculate the product of integers from 1 to 10.

3. (6 pts) Given 6 data 6,5,2,3,4,1, write the result of each iteration in insertion sort (in ascending order).

4. (6 pts) Given a binary tree with 32 nodes, write its maximal and minimal height.

5. (6 pts) What is the relationship between artificial intelligence, machine learning, and deep learning?

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試題

[第 2 節]

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—作答注意事項—

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科目名稱：醫務管理

本科目共 2 頁 第 1 頁

系所組別：資訊管理學系醫療資訊管理

1. Please list five criteria (Key Performance Indicator, KPI) to evaluate the performance of the operation of the hospital (10 points).
2. Please arrange the priority of needs for the medical records among the following area (10 points):
 - reimbursement
 - direct patient care
 - administration and management
 - Research
3. The following is outpatient statistics in a general hospital. A). Please draw a data cube to represent this flat table with the dimensions, i.e., department, time, and location. Assume the 心臟科 and 腸胃科 is classified as 內科, and 整形外科 is classified as 外科. B). Please aggregate (or roll up) the above data cube into a smaller one along the 科別 dimension. Note that you can need to show the visible part of the cube. (20 points)

Location	Department	Time	Outpatient Amount
Da-Ling	心臟科	Sept.	26
Da-Ling	心臟科	Oct.	23
Taichung	心臟科	Sept.	12
Taichung	心臟科	Oct.	9
Da-Ling	泌尿科	Sept.	29
Da-Ling	泌尿科	Oct.	13
Taichung	泌尿科	Sept.	12
Taichung	泌尿科	Oct.	8
Da-Ling	整形外科	Sept.	21
Da-Ling	整形外科	Oct.	29
Taichung	整形外科	Sept.	14
Taichung	整形外科	Oct.	9

4. For a disease W, the first-line medicine is A and second-line medicine is B. Assume there comes a new medicine C, which is effective but expensive than the old medicine B for the disease. From the data mining results for the behavior of patients, we got the association rules “A→B” and “A and ~C→B”, whose confidences are 60% and 80%, and support degrees are 83% and 77%, respectively. Please try to explain the phenomena, especially for the negative associative rule (the second rule). (10 points)

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5. Please indicate the following 5 statements in a patient record as one of the categories, S (subject), O (object), A (assessment), or P (prescription). Please use the no. of statement to answer the question. (10 points)

No	Statement
1	Upper Respiratory Infection, presumably viral.
2	Hx of Present Illness: Ms. XY is a 78 year old female previously in good health who reports a 2 day history of cough, productive of scant white phlegm. Afebrile. No dyspnea. She reports no prior history of cardiopulmonary disease. Never smoked.
3	Cough for the past two days, getting worse.
4	Complete PFTs with lung volumes. Provide educational material on inhaler usage and peak flow self-monitoring. Decrease prednisone to 20qOD alternating with 18qOD.
5	Physical Exam: HEENT: No erythema or signs of inflammation in ears or throat. No adenopathy. Respiratory: Lungs clear to auscultation. No wheeze. Cardiac: No murmur or extra heart sounds. No JVD. Extremities: No edema.

6. Please explain what is the arrangement of patient records in TOMR (Time-Oriented Medical Record)-format in SOMR (Source-Oriented Medical Record)-format and POMR-format (Problem-Oriented Medical Record), respectively. What is their pros and cons individually. (10 points)
7. The intelligent medicine becomes popular recently. A). From the patient viewpoint, what functions should be provided in bed-side monitor to achieve the requirement of intelligent medicine; B). From the physician viewpoint, what functions should be provided in the patient record writing in consulting room to achieve the requirement of intelligent medicine. (20 points)
8. A nursing plan is always affected or directed by the doctor treatment plan and the change of patient health status. A.) Please list what components (parts) a nursing plan should contain, and B). suggest how to intelligently generate the nursing plan automatically. (10 points)

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[第 2 節]

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A. Multiple Choice (3% for each, total 60%):

1. Which of the following is not a characteristic of an innovative culture?
 - (A) Focuses on means rather than results
 - (B) Low external control
 - (C) Emphasizes an open system
 - (D) Accepts ambiguity
2. To cultivate employees' external orientation and a proactive attitude towards seeking opportunities, which processes must successful managers initiate?
 - (A) Capability development process
 - (B) Entrepreneurial process
 - (C) Strategic process
 - (D) Goal-oriented process
3. Which of the following descriptions is not a characteristic of the general environment?
 - (A) The signs and signals of the general environment are clear.
 - (B) Factors in the general environment are difficult to control.
 - (C) The scope of the general environment is extensive.
 - (D) Predicting the general environment requires the involvement of various experts.
4. In marketing, which level of strategy does the use of the 4P strategy (Product, Price, Place, Promotion) belong to?
 - (A) Corporate-level strategy
 - (B) Regional strategy
 - (C) Business unit strategy
 - (D) Vertical integration strategy
5. Regarding the essence of organizational change, which statement is correct?
 - (A) Culture-based changes include job enrichment, job enlargement, and job simplification.
 - (B) Personnel-based changes are the easiest to implement and do not provoke internal resistance.
 - (C) Structure-based changes usually lead to significant transformations and effects in a short period.
 - (D) Structure-based changes should be the first in any change initiative.
6. In past research on organizational structure and innovation, which finding has not been confirmed?
 - (A) Implementing organizational changes in a matrix structure may positively impact innovation.
 - (B) In organizations with an open culture, employees are more likely to propose innovative suggestions.
 - (C) The organization's flexibility and quick responsiveness are crucial in promoting innovation.
 - (D) Having equal opportunities in the organization for expressing opinions may stimulate members' innovation potential.
7. Regarding the statements about employee recruitment and downsizing, which one is incorrect?
 - (A) Internal recruitment may enhance organizational creativity and boost existing employees' morale.
 - (B) Employee referrals are applicable in any situation because they help build a strong team.
 - (C) Private employment agencies typically recruit high-level or high-salary personnel.

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科目名稱：管理學

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科目名稱：管理學

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系所組別：資訊管理學系醫療資訊管理

- (B) Reports generated by management information systems primarily cater to individual managers, meeting their general information needs.
- (C) Decision Support Systems only require internal information and do not consider relevant information from the external environment.
- (D) The primary function of management information systems is to provide real-time information necessary for the organization's day-to-day operations.
14. Which statement is incorrect?
- (A) Information systems comprise personnel, technology, and organizational elements.
- (B) Information systems can be computerized or manually operated.
- (C) Information systems are categorized into tactical, strategic, and operational information systems.
- (D) Information systems are integrated concepts encompassing hardware, software, information, procedures, and personnel.
15. Which one is not an implied concept in management?
- (A) Acquisition, organization, and utilization of organizational resources.
- (B) Organizations cannot simultaneously pursue efficiency and effectiveness.
- (C) Management is goal-oriented.
- (D) Management is a set of activities and processes.
16. Which one is not included in Porter's Five Forces Analysis?
- (A) Bargaining power of suppliers
- (B) Bargaining power of customers
- (C) Other stakeholders' influence
- (D) Threat of new entrants
17. When there is a high tolerance for ambiguity and a preference for intuitive thinking, this corresponds to which decision-making style?
- (A) Reflective
- (B) Conceptual
- (C) Action-oriented
- (D) Planning-oriented
18. Which of the following is not an advantage of planning?
- (A) Promotes systematic and proactive activities by the organization instead of sporadic reactive responses.
- (B) Reduces the impact of change.
- (C) Avoids rigidity.
- (D) Minimizes waste and duplication in the organization.
19. Which of the following statements about the product/market matrix is incorrect?
- (A) It belongs to the overall company strategy.
- (B) New markets with existing products fall under the market development strategy.
- (C) It can be divided into market penetration and product development strategies.

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(D) It can be divided into intensive growth and diversification strategies.

20. Which description below expresses the idea of increasing the number of tasks assigned to each employee while reducing monotony and dissatisfaction with their work?

- (A) Job rotation
- (B) Job enlargement
- (C) Job enrichment
- (D) Job Complexity

B. Short Answers (40%):

1. Based on your understanding of organizational theory, discuss whether live-streaming influencers and their followers constitute a unique form of organization and provide your perspective. (8%)
2. Regarding the impact of computer technology on managerial decision-making, please discuss how it might alter the roles and capabilities of managers in rational decision-making, as well as the potential changes it may bring to the overall organizational decision-making process. Please provide at least one specific example to support your points. (10%)
3. Using McKinsey's 7-S framework, analyze the potential impact of corporate merger strategies on the other six S's of the organization (Shared Values, Strategy, Structure, Systems, Skills, Staff, Style). Provide specific analysis and comments for each S. (12%)
4. In the scenario where organizations invest substantial resources in employee training but often find that the results are merely superficial, what could be the potential reasons for this? Additionally, propose specific strategies or methods you believe could improve these issues. (10%)