

國立中正大學

111 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—

※作答前請先核對「試題」、「試卷」與「准考證」之系所組別、科目名稱是否相符。

1. 預備鈴響時即可入場，但至考試開始鈴響前，不得翻閱試題，並不得書寫、畫記、作答。
2. 考試開始鈴響時，即可開始作答；考試結束鈴響畢，應即停止作答。
3. 入場後於考試開始 40 分鐘內不得離場。
4. 全部答題均須在試卷（答案卷）作答區內完成。
5. 試卷作答限用藍色或黑色筆（含鉛筆）書寫。
6. 試題須隨試卷繳還。

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[Session I] Multiple Choice (72 points)

Choose ONE answer only for each question (3 points for each question)

1. For a grayscale image, the maximum value of each pixel is:

- A. 127 B. 255 C. 511 D. 765

2. The binary representation of 26^{-7} is:

- A. 10000 B. 10001 C. 10011 D. 10101

3. The binary representation of 70.625 is:

- A. 1000110.011 B. 1000110.101 C. 1000110.111 D. 1001010.101

4. Which one is not a type of image?

- A. GIF B. JPG C. MPG D. BMP

5. MIPS is a ____ instruction set architecture.

- A. x86 B. CISCO C. CISC D. RISC

6. 14 bitwise and 11 equals to:

- A. 8 B. 9 C. 10 D. 11

7. 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	0	4
P3	0	2

- A. 2.00 B. 2.33 C. 2.67 D. 3.00

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

- A. 6.33 B. 6.67 C. 7.00 D. 7.33

9. The computer system found in IoT devices is called:

- A. smart system B. end system
C. handheld system D. embedded system

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10. LTE is a kind of:

- A. PAN B. LAN C. WAN D. 5G RAN

11. Which of the following provides remote users with a secure connection to the original network?

- A. HTTP B. FTP C. Ethernet D. VPN

12. Which protocol is not related to the e-mail system?

- A. POP3 B. IMAP C. UDP D. TCP

13. Which of the following technology is used for tracking objects?

- A. beacon B. Bluetooth C. RFID D. IoT

14. The most common packet sniffer is called:

- A. Trojan horse B. RSA
C. spam filter D. Wireshark

15. The average time complexity of quick sort is:

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

16. Verilog is a kind of ____.

- A. machine language B. formal language
C. assembly language D. OOP language

17. 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==0)  
        cout << arr[i] << " ";  
    cout << endl;
```

- A. 0 9 36 81
B. 0 4 16 36 64
C. 0 1 4 9 16 25 36 49 64 81
D. 0 1 4

18. The traditional development phase of the software life cycle does not contain:

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- A. requirement analysis B. design
C. implementation D. selling

19. Suppose a tree has four nodes A , B , C , and D . If B and C are siblings and A 's parent is B , which nodes are leaf nodes?

- A. A and C B. A and D C. B and C D. C and D

20. Following the question above. Which node is the root?

- A. A B. B C. C D. D

21. The technique of discovering patterns in collections of data is called:

- A. database constructing B. data robbing C. data mining D. deep learning

22. ____ is a cross-language, cross-platform API for rendering 2D and 3D vector graphics.

- A. OpenCV B. OpenGL
C. OpenCL D. DeepMind

23. The ____ model is for reinforcement learning.

- A. actor-critic B. LSTM
C. GRU D. KNN

24. Which one is a NP-complete problem?

- A. depth-first-search problem B. breadth-first-search problem
C. all-pairs-shortest-path problem D. hamiltonian path problem

[Session II] Problems and Calculations (28 points)

1. Convert the Decimal number $(45)_8$ into the following carry number:

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

2. (6 pts) Given an IP address 140.123.1.1. Find its network id and host id.

3. (5 pts) Please write a function to calculate b^e for input base b and exponent e in C language. Note that both b and e are integers.

4. (6 pts) Given a binary search tree. The preorder and inorder traversal of this tree are 7,3,1,5,11,9,13,15, and 1,3,5,7,9,11,13,15, respectively. What is the level order and postorder traversal of this tree

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, respectively?

5. (5 pts) Illustrate the difference between k-means and KNN.