

一、選擇題（單選）35 題，每題 2 分，共 70 分，請在每題的選項內選擇最適當的答案。

注意：答錯倒扣 1 分，扣至零分為止。（不答不倒扣）

※ 注意：請用 2B 鉛筆作答於答案卡，並先詳閱答案卡上之「畫記說明」。

- Which of the following systems translates memorized names like www.im.ntu.edu.tw to numerical IP addresses for locating and identifying computer devices that provide services with the underlying network protocols?
(A) network address translation (B) uniform resource locators (C) name space system (D) domain name system (E) none of the above.
- A content delivery network serves content to end-users with high availability and high performance typically by deploying a globally distributed network of _____ in the Internet?
(A) multicast servers (B) http servers (C) proxy servers (D) RAID (E) none of the above.
- A generic term referring to multimedia that is constantly received by and presented to an end-user while being delivered by a provider:
(A) reality media (B) vivid media (C) broadcast (D) streaming media (E) none of the above.
- _____ refers to a computer system with a dedicated function within a larger mechanical or electrical system.
(A) Hypervisor (B) Embedded system (C) Firmware (D) Information appliance (E) Real-time operating system.
- Which of the following is the primary goal of open systems?
(A) interoperability (B) reliability (C) performance (D) manufacturability (E) feasibility.
- Which of the following is not a disk file system used in computers?
(A) FAT (B) NTFS (C) ext3 (D) exFAT (E) all of the above are disk file systems.
- _____ is designed for websites to remember stateful information or to record the user's browsing activity in the websites (such as login information and pages visited in the past)
(A) Proxy (B) Cookie (C) History tag (D) Session token (E) Session ID.
- _____ refers to a standard protocol that allows a server to dynamically distribute IP addresses and configuration information to clients:
(A) DHCP (B) DNS (C) LDAP (D) IMAP (E) DCCP.
- Which of the following is the most widely used technologies for link layer data transmission in local area networks?
(A) High-Level Data Link Control (HDLC) (B) FDDI (C) Ethernet (D) token ring (E) TCP.
- The most recent deployed version of the Internet Protocol aiming to resolve the shortage of 32-bit IP addresses:
(A) IPv4 (B) IPv5 (C) IPv6 (D) IPv7 (E) EPC Code.
- Which of the following is wrong about public key infrastructure (PKI)?
(A) digital signature is used to ensure the non-repudiation of the identity of the message receiver (B) digital signature uses the message sender's private key to encrypt the message (C) the public key of a user can be distributed to others (D) PKI uses an asymmetric cryptosystem (E) all of the above are correct (choose this one only if none of the above can be chosen).
- In a public key infrastructure (PKI), _____ functions as a trusted party that authenticates the identity of individuals, computers and other entities.
(A) registration authority (B) certificate authority (C) verification authority (D) privacy authority (E) security authority.
- Which of the following code system is more popularly used for consumers to scan an image in a poster to gain access to more information online about the product promoted in the poster?

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- (A) barcode (B) QR code (C) PDF417 (D) Qode (E) none of the above.
14. Which of the following code system is more popularly used for point-of-sales (POS)?
 (A) barcode (B) QR code (C) PDF417 (D) RFID (E) NFC.
15. Which of the following is not an interface for transmitting digital video data to a display?
 (A) DVI (B) DisplayPort (C) HDMI (D) VGA (E) all of the above are.
16. RAID (redundant array of independent disks) are mainly designed to increase the following features except:
 (A) data reliability (B) data availability (C) system performance (D) data capacity (E) disk life.
17. Which of the following is wrong about parity bit?
 (A) in odd parity systems, if the data is 1100 1111, then the parity bit should be 1 (B) in even parity systems, if the data is 1101 1111, then the parity bit should be 1 (C) parity bit is designed to detect errors (D) not all errors can be detected by parity bit (E) all of the above are correct (choose this one only if none of the above can be chosen).
18. Which of the following techniques is used to allow a computer system to install RAM with capacity much less than the operating system can support?
 (A) swap (B) virtual storage (C) page (D) core memory (E) cache.
19. Which of the following is a Linux-based operating system designed to work primarily with web apps?
 (A) OS X (B) Chrome OS (C) Android (D) iOS (E) none of the above.
20. Which of the following best describes the manufacturing process of 3D printing?
 (A) additive manufacturing (B) subtractive manufacturing (C) synthesis manufacturing (D) advanced manufacturing (E) none of the above.
21. Which of the following is not an appealing feature of 3D printing?
 (A) rapid prototyping (B) mass production (C) mass customization (D) can make a complex structure not easily done using traditional manufacturing process (E) all of the above are.
22. “Big data” has some characteristics that require specific technology and analytical methods different from traditional ones for transforming data into value. These characteristics are often described as 4Vs. Which of the following characteristics is not one of them?
 (A) volume (B) velocity (C) variety (D) veracity (E) all of the above are the characteristics.
23. Given a table named “customer” in a MySQL database with columns id, name, phone, address and all its records shown in Table 1, which of the following commands prints out all records in the tables with all attributes?
 (A) SELECT * FROM customer;
 (B) SELECT ALL FROM customer;
 (C) SELECT id FROM customer WHERE id < 5;
 (D) PRINT * FROM customer;
 (E) None of above.

Table 1 “customer”:

id	name	phone	address
1	Jay Liang	098877665544	Miaoli County
2	Vison Li	091122334455	Shinchu County
3	Shiao Wang	091234567890	Taoyuan County
4	Shiao Ming	098765432101	Taichung County

24. Given a table called "product" with columns id, name, count and all its records shown in Table 2.A, which of the following commands updates the content of Table 2.A to Table 2.B?
- (A) UPDATE product SET count=700 with name='Dryer';
 - (B) UPDATE product RESET count=700 where id=3;
 - (C) UPDATE product RESET count=700 with name='Dryer';
 - (D) SET product UPDATE count=700 where id=3;
 - (E) None of above.

Table 2.A

id	name	count
1	Pomade	500
2	Conditioner	800
3	Dryer	500
4	Hair Styler	300

Table 2.B

id	name	count
1	Pomade	500
2	Conditioner	800
3	Dryer	700
4	Hair Styler	300

25. Which of the following is correct about Linux?
- (A) It is the most popularly used OS in desktops (B) It is the most popularly used OS in laptops (C) It is the most popularly used OS in tablets (D) It is the most popularly used OS in mobile phones (E) none of the above.
26. Which of the following operations is the main cause of disk fragmentation?
- (A) read and write (B) delete and write (C) read and create (D) write (E) read and delete.
27. Which of the following is typically associated with DDoS (distributed denial of service) to launch the attack?
- (A) botnet (B) back door (C) spoofing (D) script kiddie (E) hacker.
28. _____ refers to the type of temporarily storage for storing data to be used later on?
- (A) swap (B) cache (C) RAM (D) CMOS (E) flash.
29. Which of the following services builds a social network among professionals? (A) LinkedIn (B) Twitter (C) Pinterest (D) Tumblr (E) Quora.
30. Which of the following technology best relates to Google glasses?
- (A) Internet of Things (B) Virtual Reality (C) Smart Machine (D) Augmented Reality (E) mobile computing.
31. Which of the following terms embraces a number of contemporary automation, data exchange and manufacturing technologies to realize the vision of a smart factory and manufacturing?
- (A) Industry 2.0 (B) Industry 3.0 (C) Industry 4.0 (D) Industry 5.0 (E) Industry 6.0
32. Which of the following is wrong about systems development life cycle?
- (A) analysis phase should precede design phase (B) design phase should precede implementation phase (C) planning phase should precede design phase (D) implementation phase should precede maintenance phase (E) all of the above are correct.
33. Which of the following ISO family is for quality management systems standards designed to help organizations ensure that they meet the needs of customers and other stakeholders while meeting statutory and regulatory requirements related to a product?

- (A) ISO 27000 (B) ISO 9000 (C) ISO 14000 (D) ISO 26000 (E) none of the above.
34. Which of the following ranges best describes current hard disk capacity in the market?
(A) 200~500GB (B) 200GB~1TB (C) 500GB~3TB (D) 4TB~10TB (E) 10~20TB.
35. In an ER diagram, entities are commonly represented by
(A) box (B) diamond (C) circle (D) line (E) oval.

二、問答題 2 題，每題 15 分，共 30 分。
請在答案卷內依序作答，否則不予以計分。

1. Consider binary search trees and their traversals. Please give an algorithm in suitable pseudocode for the preorder traversal of a binary search tree. Suppose 6, 2, 1, 3, 5, 9, 7, 8 is the sequence of key values obtained from the preorder traversal of a binary search tree. What does the original tree look like? Please draw the tree showing the key values stored in the tree nodes. If one performs a postorder traversal on the tree, what sequence of key values will one obtain?
2. Design an algorithm that, given an array of integral numbers (integers), rearranges the numbers stored in the array so that the array consists of two consecutive parts with all the odd numbers in the first part and all the even numbers in the second, i.e., all the odd numbers are moved to the left of the even numbers. Please describe your algorithm in suitable pseudocode. What is the time complexity of your algorithm? Please detail your analysis. The more efficient your algorithm is, the more points you will be credited for this problem.

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