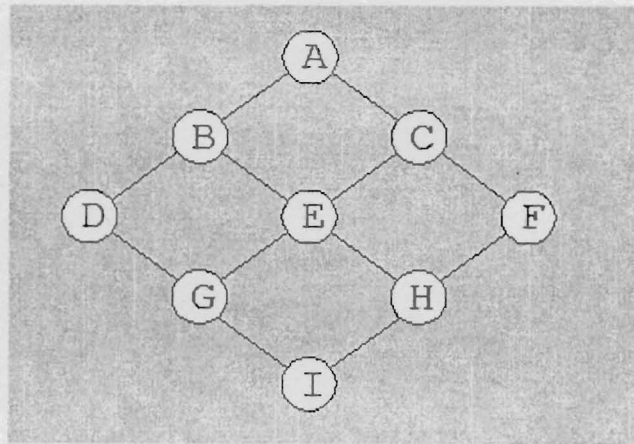




國立雲林科技大學 105 學年度
碩士班招生考試試題

系所：資管系
科目：資料結構

1. 假設有一個二維陣列 $A[m][n]$ ， m 為其行(Row)的大小、 n 為其列(Column)的大小，陣列 A 的起始位置為 α ，試分別寫出以列為主(Row Major)及以行為主(Column Major)，計算陣列元素 $A[i][j]$ 儲存位置的公式。(10%)
2. 試分別舉出單向鏈結串列(Single Linked List)、雙向鏈結串列(Double Linked List)、環狀串列(Circular Linked List)、佇列(Queue)及堆疊(Stack)等資料結構各一個應用實例。(10%)
3. 試寫出利用遞迴(Recursive)函數求兩個正整數最大公因數的演算法。(10%)
4. 試以子節點由右至左的優先順序，例如節點 A 先 C 後 B，分別寫出下圖深度優先搜尋法(Depth-first Search)及廣度優先搜尋法(Breadth-first search)的搜尋順序。(10%)



5. 試分別寫出快速排序法(Quick Sort)及挑選排序法(Selection Sort)，排序資料【49、36、21、89、6、57、91、64、14、73】的過程。(10%)
6. 請作答下列兩個問題：
 - (a) 請以虛擬碼設計一個演算法可以比對字串 $S[1..n]$ 中是否包含子字串 $P[1..m]$ ， $m \leq n$ ？若有，則輸出 P 在 S 中的位置。(10%)
 - (b) 請分析演算法的時間複雜度。(5%)



7. 請作答下列問題：
- (a) 請嚴謹地定義何謂二元搜尋樹(Binary Search Tree)。(5%)
 - (b) 以虛擬碼設計演算法 `BSTrecInsert(T, k)`於二元搜尋樹 `T` 中新增一個鍵值 `k`。(10%)
 - (c) 請以一個實例完整地說明，如何於二元搜尋樹中刪除某一個鍵值。請考慮各種不同的狀況。(10%)
8. 請詳細地說明雜湊表(hash table)搜尋法，包括如何新增一筆資料、如何搜尋一筆資料、碰撞處理方法以及搜尋的時間複雜度？(10%)



Part A

I. 選擇題 (30%).

1. Which of the following is true about the impact of Moore's Law on business professionals?
 - A) They need to be able to assess, evaluate, and apply emerging information technology to business.
 - B) They have to concentrate more on developing routine skills than nonroutine skills.
 - C) They need to be able to develop better communication and information technologies.
 - D) They no longer need to focus on skills such as abstract reasoning and collaboration.

2. A _____ is a network of activities for accomplishing a business function.
 - A) process capital
 - B) task force
 - C) business portfolio
 - D) business process

3. According to Porter, to be effective, an organization's goals, objectives, culture, and activities must be consistent with the organization's _____.
 - A) functions
 - B) competitors
 - C) strategy
 - D) workforce

4. The _____ refers to the idea in which objects are becoming connected to the Internet so that they can interact with other devices, applications, or services.
 - A) Premium Internet
 - B) Symbian
 - C) Internet of Things
 - D) server farm

5. Host operating systems that run one or more operating systems as applications are referred to as _____.
 - A) application programs
 - B) server farms
 - C) server operating systems
 - D) virtual machines

6. _____ refers to software products that support very high transaction rates, processing relatively simple data structures, replicated on many servers in the cloud.
 - A) NoSQL DBMS
 - B) MySQL DBMS
 - C) Traditional DBMS
 - D) Relational DBMS

7. Which of the following statements best defines the cloud?
 - A) The cloud is the elastic leasing of pooled computer resources over the Internet.
 - B) The cloud is a peer-to-peer network used to share data between users.
 - C) The cloud is the elastic leasing of in-house computer hardware.
 - D) The cloud is the network of servers hosted in-house by an organization for its own requirements.



8. Which of the following statements is true of Web services?
- A) They are programs designed using the concept of service-oriented architecture.
 - B) They are programs that comply with IEEE 802.3 protocol standard.
 - C) They are programs that comply with Web service standards and can only run as an independent program.
 - D) They are designed in such a way that they cannot be flexibly combined with other programs.
9. Which of the following statements is true of enterprise information systems?
- A) They are information systems that are shared by two or more independent organizations.
 - B) The solutions to problems in these systems usually involve more than one department.
 - C) They typically support less than 100 users.
 - D) They are called personal information systems if they support a particular business function.
10. Which of the following statements is true of social customer relationship management (CRM)?
- A) Relationships between organizations and customers are unchanging.
 - B) Each customer crafts his or her own relationship with a company.
 - C) Sales managers can control what a customer is reading about a company and its products.
 - D) Customers who are likely to make the highest purchases are likely to receive the most attention.
11. _____ is a technique for intercepting computer communications.
- A) Spoofing
 - B) Phishing
 - C) Pretexting
 - D) Sniffing
12. Which of the following uses an individual's personal physical characteristics such as fingerprints, facial features, and retinal scans for verification purposes?
- A) credit card
 - B) smart card
 - C) biometric authentication
 - D) symmetric encryption
13. An organization that wishes to leverage the power of social media and elastic cloud opportunities to help accomplish its goals and objectives should ideally turn to the _____ group within its IT department for information.
- A) operations
 - B) development
 - C) technology
 - D) data administration
14. The process of creating and maintaining information systems is called _____.
- A) systems development
 - B) systems acquisition
 - C) systems definition
 - D) systems configuration



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15. Which of the following is the first step in defining a new information system?

- A) Assess the feasibility of the project.
- B) Explain the goals and scope of the project.
- C) Determine the schedule and budget for the project.
- D) Form the project team.

II. 問答題 (20%)

- 1) Define information technology (IT) and information systems (IS), then explain the difference and the relationship between them.
- 2) Based on Porter's five forces model, describe general competitive strategies as well as those based on business processes.

★ Part B 請見次頁。



PART B 50%

I. Choice Question 30%

1. The first phase in the customer life cycle involves _____.
 - A) sending messages to target audiences to attract customer prospects
 - B) attempting to win back high-value customers
 - C) converting prospects into customers who need to be supported
 - D) increasing the value of existing customers by selling more products to them

2. During which of the following phases of the customer life cycle does win-back processes categorize customers according to value?
 - A) customer acquisition B) marketing C) relationship management D) churn

3. Which of the following statements is true about ERP?
 - A) ERP is a suite of software applications that integrates existing systems by providing layers of software that connect applications together.
 - B) The two major components of ERP systems are manufacturing applications and inventory applications.
 - C) Enterprise resource planning (ERP) is also referred to as enterprise application integration (EAI) due to its highly efficient integration properties.
 - D) ERP systems are used to forecast sales and to create manufacturing plans and schedules to meet those forecasts.

4. _____ is a person's belief that he or she can be successful at his or her job.
 - A) Extroversion B) Conscientiousness C) Self-actualization D) Self-efficacy

5. Inter-enterprise PRIDE systems are referred to as _____ because in such systems processing is divided across multiple computing devices.
 - A) distributed systems B) departmental information systems C) business intelligence systems D) integrated systems

6. Which of the following statements is a characteristic of user communities?
 - A) Social Media (SM) user communities are mostly based on geographic and familial ties.
 - B) Most users of SM belong to several different user communities.
 - C) In community-SM site relationships, the relationships in second-tier communities are disassociated from first-tier users.
 - D) A viral hook is an inducement to constrain communications between user communities.

7. Which of the following statements is true about viral hooks?
 - A) It is used to restrain information leaks from an organization.
 - B) It is used to enhance an organization's privacy on its SM sites.
 - C) It is designed to root out users who post junk content on an organization's SM site.
 - D) It is an inducement to pass communication along the tiers of a community.

8. Which of the following statements is a feature of social media application providers?
 - A) They do not support custom software for long durations as it is expensive.
 - B) They generally charge users a license fee to use their applications.
 - C) They use elastic, cloud-based servers to process SM sites.
 - D) They sponsor content on SM sites.



9. Which of the following statements is true of defenders of belief?
- They seek conformity and want to convince others of the wisdom of their opinions.
 - Their communities do not facilitate activities like sales and marketing.
 - They are effective for activities that involve innovation and problem solving.
 - When confronted with contrary evidence, they change their opinion
10. According to McAfee, Enterprise 2.0 workers want applications that enable them to rate tagged content and to use the tags to predict content that will be of interest to them. Which of the following characteristics of Enterprise 2.0 does this refer to?
- search
 - links
 - signals
 - extensions
11. Which of the following statements is true of social networking problems?
- Responses to problematic content are best reserved for instances where it has caused the organization to do something positive.
 - Inappropriate contributions that contain obscene or otherwise inappropriate content should be ignored indefinitely.
 - The product development team should not receive the criticisms posted on a social networking site.
 - If the problematic content represents reasonable criticism of the organization's products, the best response is to delete it.
12. The use of an organization's operational data as the source data for a BI system is not usually recommended because it _____.
- is not possible to create reports based on operational data
 - is not possible to perform business intelligence analyses on operational data
 - requires considerable processing and can drastically reduce system performance
 - considers only external data and not internal data regarding an organization's functions
13. Which of the following statements is true of unsupervised data mining?
- Analysts apply data mining techniques to estimate the parameters of a developed model.
 - Analysts create hypotheses only after performing an analysis.
 - Regression analysis is the most commonly used unsupervised data mining technique.
 - Data miners develop models prior to performing an analysis.
14. A _____ performs a wide range of activities such as programming, testing, database design, communications and networks, project management, and so on, and is required to have an entrepreneurial attitude.
- systems analyst
 - consultant
 - small-scale project manager
 - database administrator
15. Which of the following is an advantage of outsourcing information systems?
- An outsourcing company is typically in complete control of the process.
 - The long-term costs may exceed long-term benefits.
 - It can be an easy way to gain expertise otherwise not known.
 - The vendors can gain significant knowledge of the outsourcing company.

II. Terminology 20%

- Crowdsourcing
- Viral marketing
- Online analytical processing (OLAP)
- Outsourcing