

CIS Program

e-commerce 1

1. The written document that identifies the business goals and outlines the plan how to achieve them is called:

a) Business plan

b) business model

c) revenue model

d) Business case

2. The revenue model that a company receives commission paid on the volume of transaction made is called:

a) Affiliate fees

b) Subscription fees

c) Transaction fees

d) Sales

3. Data Encryption Standard (DES) algorithm is an example of -----

a) Public key encryption

b) Private key encryption

c) Digital signature

d) Asymmetric systems

4. Which of the following is not a limitation of EC?

a) Some customers like to physically inspect products before buying

b) Customers now have nearly unlimited bandwidth

c) The standards for security are still evolving

d) Software tools change frequently

5. Which of the following is a benefit of EC?

a) Individuals can telecommute more easily

b) Insufficient telecommunications bandwidth

c) Customers may be unsure of EC security

d) EC theory and practice is constantly evolving

6. Which of the following is a pure electronic commerce corporation?

a) Mike's business sells products out of his store in Chicago

b) Tom's business sells products out of his store in Chicago and online

c) Jane's business sells products out of her website

d) Ann's business sells products out of her website and mail order catalog

7. The purpose of a digital certificate is to:

a) Verify that the holder of a public and private key is who they claim to be.

- b) Verify the time a message was sent.
- c) Verify the domain name of the computer that sent a message.
- d) Encrypt data so that it cannot be easily intercepted by hackers.

8. Third parties who issue digital certificates are called:

- a) Certificate brokers.
- b) Certificate processors.
- c) Certificate issuers.
- d) Certificate authorities.**

9. Currently, digital certificates may be used to authenticate all of the following **EXCEPT**:

- a) Web sites (site certificates).
- b) Individuals (individual certificates).
- c) Merchants (merchant certificates).**
- d) Software companies (publisher certificates).

10. The card which provides the holder credit to make purchases which are paid in full upon receipt of the monthly statement is called the:

- a) Credit card.
- b) Charge card.**
- c) Debit card.
- d) e-wallet.

11. Dell Computers allows its customers to design computers which meet specific needs. This is an example of the _____ EC business model.

- a) Find the best price
- b) Group purchasing
- c) Affiliate marketing
- d) Customization and personalization**

12. Which of the following is **not** a type of EC?

- a) B2B
- b) B2C
- c) C2C
- d) D2B**

13. Which of the following is not an example of an e-payment?

- a) Smart cards
- b) Cash**
- c) Digital checks
- d) Electronic billing

14. The mathematical formula used to encrypt information is what part of cryptography?

a) Plaintext

b) Cipher text

c) Encryption algorithm

d) Key

15. Which of the following is not one of the major types of payment cards?

a) Credit cards

b) Charge cards

c) Debit cards

d) Flip cards

Management Information Systems

1. ____ is the raw material in the production of information.

a. **Data**

c. Managing

b. Decision making

d. Programming

2. Simply put, a ____ is an array of components that work together to achieve a common goal, or multiple goals, by accepting input, processing it, and producing output in an organized manner.

a. plan

c. project

b. process

d. **system**

3. A(n) ____ interfaces and interacts with other systems.

a. closed system

c. initial system

b. final system

d. **open system**

4. Thinking of an organization in terms of its sub-organizations or subsystems called _____ is a powerful management approach.

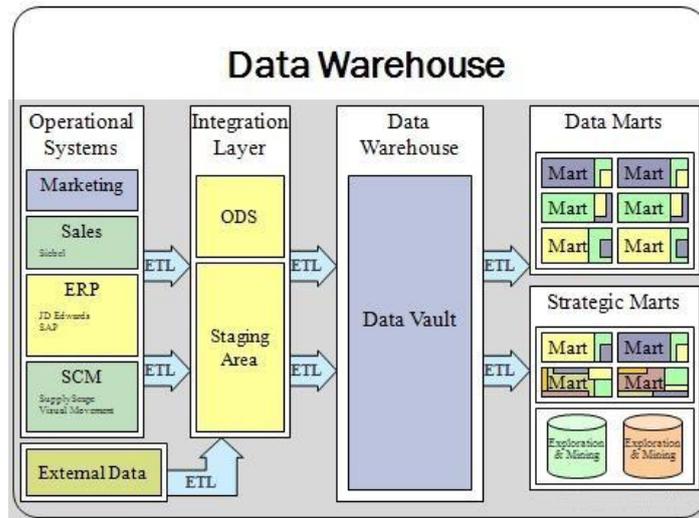
- a. organization thinking
 - b. organization validating
 - c. **systems thinking**
 - d. systems validating
5. In today's world, organizations must continuously ____ hardware, software, and the skills of their employees to stay competitive.
- a. downsize
 - b. share
 - c. specify
 - d. **upgrade**
6. Business intelligence applications access large pools of data, usually transactional records stored in large databases called ____.
- a. **data warehouses**
 - b. decision data
 - c. demographic data
 - d. supply chains
7. ____ have been used to provide service via the Web, such as helping residents find locations of different services on a city map or plan travel routes.
- a. BIs
 - b. DSSs
 - c. **GISs**
 - d. MISs
8. In ____, information systems help organize budgets, manage cash flow, analyze investments, and make decisions that could reduce interest payments and increase revenues from financial transactions.
- a. accounting
 - b. e-commerce
 - c. **finance**
 - d. marketing
9. ____ systems mainly help in record-keeping, employee evaluation, and employee benefits.
- a. Accounting
 - b. Financial
 - c. **Human resource (HR) management**
 - d. Marketing
10. Many IT professionals start their careers as programmers, or programmer/analysts, and then are promoted to ____, positions that require a broad range of skills.

- a. network administrators
 - b. network analysts
 - c. systems administrators
 - d. **systems analysts**
11. A ____ is partly involved in the analysis of business needs and ISs, but the greater part of the job involves setting up business applications.
- a. database analyst
 - b. database programmer
 - c. **programmer/analyst**
 - d. systems administrator
12. A ____ is responsible for researching, planning, and recommending software and systems choices to meet an organization's business requirements.
- a. database designer
 - b. programmer
 - c. project manager
 - d. **systems analyst**
13. A ____ is responsible for the databases and data warehouses of an organization—a very sensitive and powerful position.
- a. **database administrator**
 - b. database programmer
 - c. project leader
 - d. project manager
14. A ____ is responsible for developing or acquiring database applications and must carefully consider how data will be used.
- a. **DBA**
 - b. database programmer
 - c. programmer
 - d. systems analyst
15. A ____ is highly involved in the implementation of SCM systems, because they access corporate databases.
- a. **DBA**
 - b. database programmer
 - c. programmer
 - d. systems analyst

Data Warehousing

1. The full **form** of OLAP is

- A) Online Analytical Processing
- B) Online Advanced Processing
- C) Online Advanced Preparation
- D) Online Analytical Performance



2. is a subject-oriented, integrated, time-variant, nonvolatile collection or data in support of management decisions.

- A) Data Mining
- B) Data Warehousing
- C) Document Mining
- D) Text Mining

3. The data is stored, retrieved and updated in

- A) OLAP
- B) OLTP
- C) SMTP
- D) FTP

4. An system is market-oriented and is used for **data analysis** by knowledge workers, including managers, executives, and analysts.

- A) OLAP
- B) OLTP
- C) Both of the above
- D) None of the above

5. is a good alternative to the star schema.

- A) Star schema
- B) Snowflake schema
- C) Fact constellation
- D) Star-snowflake schema

6. The exposes the information being captured, stored, and managed by operational systems.

- A) top-down view
- B) data warehouse view
- C) data source view
- D) business query view

7. The type of relationship in star schema is

- A) many to many
- B) one to one
- C) one to many
- D) many to one

8. The allows the selection of the relevant information necessary for the data warehouse.

- A) top-down view
- B) data warehouse view
- C) data source view
- D) business query view

9. Which of the following is not a component of a data warehouse?

- A) Metadata
- B) Current detail data
- C) Lightly summarized data
- D) Component Key

10. Which of the following is not a kind of data warehouse application?

- A) Information processing

- B) Analytical processing
- C) Data mining
- D) Transaction processing**

11. Copying and integrating data from transactional database and other data sources in preparation for cleansing and loading into the data warehouse is called:

- A. Extract**
- B. Transform
- C. Load
- D. None of the above

12. Cleaning and converting data to prepare it for loading into the data warehouse is called:

- A. Extract
- B. Transform**
- C. Load
- D. None of the above

13. The process of transforming data from a detailed to a summary level is called:

- A. Extracting.
- B. Updating.
- C. Aggregating**
- D. Joining.

14. An example of distribute measure is

- A. count.
- B. Sum.
- C. Max
- D. All of the above**
- E. None of the above

15. An example of algebraic measure is

- A. count.
- B. Sum.
- C. Average**
- D. All of the above
- E. None of the above

16. With multidimensional modeling, "Dimensions" are used to:

- A. Quantify facts, usually numeric values.
- B. Analyze data from several perspectives, (for example: Time and Location)**
- C. Extract and transform data from several systems
- D. Cache the results of executing data warehousing query.

Data Mining

1. Finding relations between the registrations of different courses in a university warehouse is

- (A) Clustering
- (B) **Association**
- (C) Classification
- (D) Non of them

2. Dividing the families according to their standard of living into groups is

- (A) **Clustering**
- (B) Association
- (C) Classification
- (D) Non of them

3. For the following Data set

Transaction	Items_bought
T1	{K, A, D, B}
T2	{D, A, C, E, B}
T3	{C, A, E, B}
T4	{B, A, D}

Support $\{A, B\} \rightarrow \{D\}$ is

- (A) **75%**
- (B) 50%
- (C) 30%
- (D) 100%

4. Data Preprocessing consists of

- (A) Cleaning
- (B) Reduction
- (C) Transforming and Loading
- (D) **All of the above**

5. Finding missing values can be done using

- (A) Overall average
- (B) Class average
- (C) Most popular value
- (D) **All of the above**

6. Data mining techniques can be

- (A) Classification and prediction
- (B) Clustering
- (C) Association
- (D) **All of the above**

7. Finding relations between smokers and Cancer is of type

- (A) Clustering
- (B) Classification
- (C) **Association**
- (D) Non of the above

8. Grouping houses in a city according to their prices is of type
- (A) Clustering**
 - (B) Classification
 - (C) Association
 - (D) Non of the above
9. Bayessian algorithm is used for
- (A) Clustering
 - (B) Classification**
 - (C) Association
 - (D) Prediction
10. Apriori algorithm is used for
- (A) Clustering
 - (B) Classification
 - (C) Association**
 - (D) Prediction
11. K-Means method is used for
- (A) Clustering**
 - (B) Classification
 - (C) Association
 - (D) Prediction and smoothing
12. Putting objects into groups with undefined class labels is called
- (A) Classification
 - (B) Association
 - (C) Prediction and smoothing
 - (D) Clustering**
13. Putting objects into groups with previously defined class labels is called
- (A) Classification**
 - (B) Association
 - (C) Prediction and smoothing
 - (D) Clustering
14. Confidence $A \rightarrow B$ in a data set D is given by
- (A) $P(A)/P(B)$
 - (B) $P(B)/P(A)$
 - (C) $P(A \cup B)/P(A)$**
 - (D) $P(A \cup B)/D$
15. Support $A \rightarrow B$ in a data set D is given by
- (A) $P(A)/P(B)$
 - (B) $P(B)/P(A)$
 - (C) $P(A \cup B)/P(A)$
 - (D) $P(A \cup B)/D$**
16. A strong itemset refers to the itemset having
- (A) Support greater than the minimum support**
 - (B) Support less than the minimum support
 - (C) Confidence greater than the minimum confidence

(D) An instance of the fact table

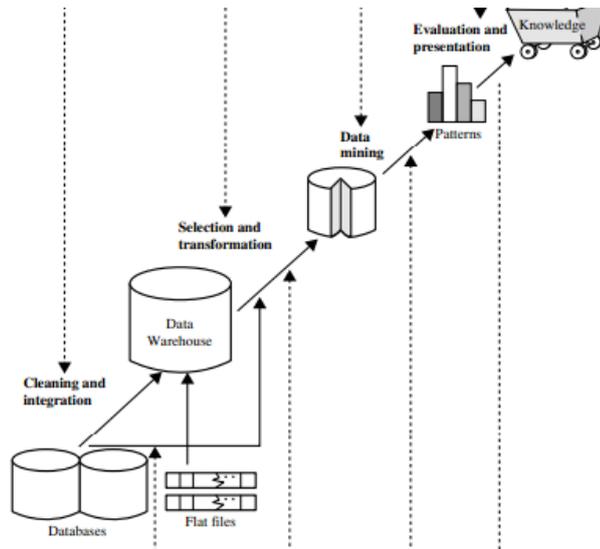
17. Frequent items refer to

- (A) **Items that came or purchased together within the specified support and confidence**
- (B) Any items in a given transaction
- (C) Items having support less than the minimum support
- (D) Non of the above

18. Finding out the population for the next ten years is of type

- (A) Classification
- (B) Association
- (C) Clustering
- (D) **Prediction**

19. is an essential process where intelligent methods are applied to extract data patterns.



- A) Data warehousing
- B) Data mining**
- C) Text mining
- D) Data selection

20. Data mining can also applied to other forms such as

- i) Data streams
- ii) Sequence data
- iii) Networked data
- iv) Text data
- v) Spatial data

- A) i, ii, iii and v only
- B) ii, iii, iv and v only
- C) i, iii, iv and v only
- D) All i, ii, iii, iv and v**

21. Which of the following is not a data mining functionality?

- A) Characterization and Discrimination
- B) Classification and regression
- C) Selection and interpretation**
- D) Clustering and Analysis

22. is a summarization of the general characteristics or features of a target class of data.

- A) Data Characterization**
- B) Data Classification
- C) Data discrimination
- D) Data selection

23. is a comparison of the general features of the target class data objects against the general features of objects from one or multiple contrasting classes.

- A) Data Characterization
- B) Data Classification
- C) Data discrimination**
- D) Data selection

24. Strategic value of data mining is

- A) cost-sensitive
- B) work-sensitive
- C) time-sensitive**
- D) technical-sensitive

25. is the process of finding a model that describes and distinguishes data classes or concepts.

- A) Data Characterization
- B) Data Classification**
- C) Data discrimination
- D) Data selection

26. The various aspects of data mining methodologies is/are

- i) Mining various and new kinds of knowledge**
- ii) Mining knowledge in multidimensional space**
- iii) Pattern evaluation and pattern or constraint-guided mining.**
- iv) Handling uncertainty, noise, or incompleteness of data**

- A) i, ii and iv only
- B) ii, iii and iv only
- C) i, ii and iii only
- D) All i, ii, iii and iv**

27. The full form of KDD is

- A) Knowledge Database
- B) Knowledge Discovery Database**
- C) Knowledge Data House
- D) Knowledge Data Definition

28. The output of KDD is

- A) Data
- B) Information
- C) Query
- D) Useful information

Data Base Administration

1) Which of the following table space holds the data dictionary:

- a) INDX
- b) USERS
- c) SYSTEM
- d) TEMP

2) A tablespace can be dropped even if it contains data by including the following option:

- a) DROP ALL DATA
- b) ON CASCADE
- c) WITH OBJECTS
- d) INCLUDING CONTENTS

3) Deadlock happens when

- a) Two trans reading the same data items
- b) Two trans writing the same data items
- c) Two trans waiting for each other to unlock data items
- d) Two trans run simultaneously
- e) None of the above

4) The following is not a property of a transaction

- a) Atomicity
- b) Durability
- c) Redoing
- d) Isolation
- e) Consistency

5) What keyword must be included in a DROP USER statement if you want to drop a user that owns objects?

- a) ALL
- b) DELETE CONSTRAINTS
- c) BYPASSING REFERENTIAL INTEGRITY
- d) CASCADE

6) The two types of Oracle Server privileges are:

- a) Table and DBA
- b) Item and system
- c) Object and DBA
- d) Object and system

7) To grant object privileges for objects you do not own, you must have the privileges with the following option:

- a) CASCADE
- b) ADMIN
- c) GRANT
- d) EXTERNAL

8) Recovery means that

- a) The database can be restored to operation after database damage and failure.
- b) The mechanism used to insure the separation of concurrent activities
- c) The database provides an access control for authorized users
- d) Certain rules to be preserved in the database data.

9) A view is

- a) A subset of the database, presented to one user or set of users
- b) A set of files interrelated to each other
- c) A set of relations in a relational database
- d) None of the above

10) One of the following is a benefit of database views:

- a) Reducing security on the data
- b) Increasing complexity of user perspective on the data
- c) Customize the appearance of the database
- d) Violate program-data independence

11) Concurrency in DBMS means

- a) The restoration of the databases after any type of failure
- b) More than one user can access the same data items at the same time.
- c) More than one user can change the same data item at the same time.
- d) No more than one user can access the same data items at the same time.

12) Software that defines a database, stores the data, supports a query language, produces reports and creates data entry screens is a:

- A) data dictionary
- B) database management system (DBMS)
- C) decision support system
- D) relational database

13) The separation of the data definition from the program is known as:

- A) data dictionary
- B) data independence
- C) data integrity
- D) referential integrity

14) In the client / server model, the database:

- A) is downloaded to the client upon request
- B) is shared by both the client and server
- C) resides on the client side
- D) resides on the server side

- 15) The traditional storage of data that is organized by customer, stored in separate folders in filing cabinets is an example of what type of 'database' system?
- A) Hierarchical
 - B) Network
 - C) Object oriented
 - D) Relational
- 16) The database design that consists of multiple tables that are linked together through matching data stored in each table is called a:
- A) Hierarchical database
 - B) Network database
 - C) Object oriented database
 - D) Relational database

Information Network Security

- 1) Which of the following is FALSE about hash functions
- A. Can be applied to any sized message M
 - B. Produces fixed-length output h
 - C. It is easy to compute $h=H(M)$ for any message M
 - D. Given h, it is feasible to find x, where $(H(x)=h)$
- (2) A dedicated appliance or software running on a device installed between the internal network of a system and public networks (Internet) to forward some packets and filter out others is known as:
- A. Router
 - B. Firewall
 - C. Switch
 - D. Gateway
- (3) Which sequence is correct for the virus operation?
- A. Dormant, propagation, triggering, execution
 - B. Propagation, triggering, execution, dormant
 - C. Dormant, execution, triggering, propagation
 - D. Dormant, triggering, propagation, execution
- (4) The policy in which the firewall shall drop all packets arrive to it regardless of destination port number they want to communicate with is called:
- A. Default drop policy
 - B. Default accept policy
 - C. Specified accept policy
 - D. Random drop policy
- (5) Digital signature provides _____
- A. Authentication
 - B. Nonrepudiation
 - C. Both (A) and (B)
 - D. Neither (A) nor (B)

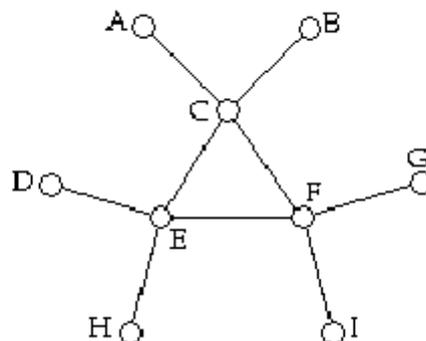
- (6) **Malicious code embedded in legitimate program is called**
- A. Trap door
 - B. Logic bomb
 - C. Zombie
 - D. Trojan horse
- (7) **A piece of self-replicating code attached to some other code is referred to as:**
- A. Worms
 - B. Viruses
 - C. Zombies
 - D. Trapdoors
- (8) **Which of the following is FALSE about Trojan horse?**
- A. Program with hidden side-effects
 - B. Activated when specified conditions met
 - C. When run performs some additional tasks, for example allowing attacker to indirectly gain access they do not have directly
 - D. Used to propagate a virus/worm or install a backdoor
- (9) **A virus spreads using E-mail with attachment containing a macro virus is called**
- A. Macro virus
 - B. E-mail virus
 - C. Worms
 - D. Trojan horse
- (10) **An authentication technique involves the use of a secret key to generate a small fixed-size block of data is known as:**
- A. Message authentication code (MAC)
 - B. Encryption
 - C. Decryption
 - D. Digital signature
- (11) **A secret entry point into a program allows those who know access bypassing usual security procedures is**
- A. Trap door
 - B. Logic bomb
 - C. Zombie
 - D. Trojan horse

Wireless Networks

- Q 1: HSPA stands for _____.
- A) **High Speed Packet Access**
 - B) High Signal Packet Access
 - C) High stream Packet Access
 - D) High Spread Packet Access
- Q 2: A user needs to send 3 bits using DSSS, if the user has spreading code consists of 8 bits what is the total transmitted bits?
- A) 3 bytes
 - B) 8 bytes
 - C) **24 bytes**
 - D) 12 bytes
- Q 3: Which of the following technologies has the highest data rate?
- A) UMTS
 - B) **LTE**
 - C) HSPA
 - D) HSPA+
- Q 4: UMTS technology does not use Internet Protocol
- Yes **No**
- Q 5: In CDMA all users' data transmitted simultaneously over one channel .
- Yes** No
- Q 6: Loss of data is one of wireless technology disadvantage.
- Yes** No

Algorithms

1. How many spanning trees does the following graph have?



- a. **3**
- b. 2
- c. 1
- d. None of the above

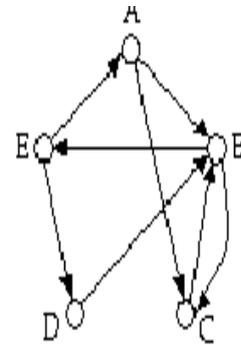
2. Which of the following is not a path from vertex A to vertex E in the digraph?

a. A, B, D, E

b. A, B, E

c. A, C, B, E

d. A, B, C, B, E



3. Let k be an integer greater than 1. Which of the following represents the order of growth of the

$$\sum_{i=1}^n k^i$$

as a function of n ?

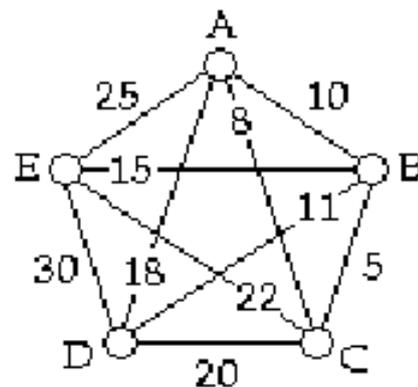
a. $\theta(k^n)$

b. $\theta(k^n \log n)$

c. $\theta(k^{n \log n})$

d. $\theta(k^{2kn})$

4. Using Kruskal's algorithm, which edge should we choose second?



a. CD

c. AC

b. AB

d. None of the above

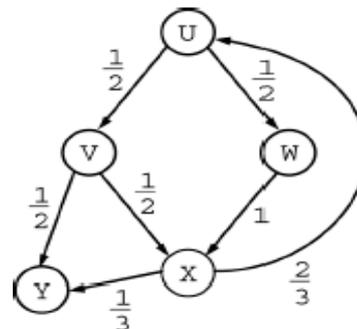
5. The big Oh for the following Algorithm segment is

```
A= 0
for i=1 to n
  { for j=1 to I A= A+1 }
```

- a. $O(n)$
- b. $O(n^3)$
- c. $O(n^2)$
- d. non

6. For the following code, the bias of each conditional branch in the code is labeled on the control flow graph to the right. For example, the Boolean expression if_condition evaluates to true on one-half of the executions of that expression.

```
do
{
  U;
  if (if_condition)
  {
    V;
    if (break_condition)
      break;
  }
else
  W;
  X;
} while (loop_condition);
Y;
```



What is the expected number of times that U executes?

(A) 1

(B) 1.5

(C) 2

(D) More than 10

7. An undirected graph G consists of "4" vertices with equal degrees. If the number of edges = 4, then the degree of each vertex =

- a) 16
- b) 8
- c) 2
- d) 1

8. The number of the edges of a tree with 10 vertices is equal to:

- a) 7
- b) 9
- c) 11
- d) 13

9. Which of the following formulas in big-O notation best represent the expression

$$n^2 + 35n + 6?$$

- a. $O(n^3)$
- b. $O(n^2)$
- c. $O(n)$
- d. $O(42)$

10. What is the worst-case time for serial search finding a single item in an array?

- a. $O(1)$
- b. $O(n \log n)$
- c. $O(n)$
- d. $O(n^3)$

11. Which of the following algorithms runs in $N \log N$ average time but quadratic worst-case time?

- a. insertion sort
- b. merge sort
- c. quicksort
- d. shellsort

12. What is the running time of the Heapsort on an array of length n that is *already sorted* in increasing or decreasing order?

- a. Increasing order is $\theta(n \lg n)$, while decreasing order is $\theta(n^2)$
- b. Both are $\theta(n \lg n)$**
- c. Increasing order is $\theta(n^2)$, while decreasing order is $\theta(n \lg n)$
- d. Both are $\theta(n^2)$

13. Suppose the input to Partition algorithm of Quicksort is a set of equal integers. The worst-case time of Partition will be:

- a. $O(1)$
- b. $O(n)$**
- c. $O(n \lg n)$
- d. None of the above

14. Suppose the input to Partition algorithm of Quicksort is a set of equal integers. The recurrence equation will be:

- a. $T(n) = T(n-1) + n$
- b. $T(n) = T(n-1) + n \log n$
- c. $T(n) = 2T(n/2) + n$**
- d. $T(n) = T(n/2) + n$

Data Base

1. Which schema level hides the details of physical storage structures and concentrates on describing entities, relationships and constraints of the whole database?

- a. Conceptual (logical) level**
- b. internal (physical) level
- c. external (view) level
- d. sea level

2. Physical data independence can be defined as

a. the capacity to change the physical representation and access techniques without having to change application programs.

b. the capacity to change the logical level without having to change application programs.

c. the capacity to change the view level without having to change application programs.

d. all the above.

3. A weak entity type

a. must have total participation in an identifying relationship

b. does not have a key attribute(s)

c. both (a) and (b)

d. none of the above

4. A multivalued attribute A, of an entity E, should be mapped to the relational model by

a. including a column for A in the relation corresponding to entity type E

b. defining a new table with a single column A

c. defining a new table with two columns, one for A and one for the key of E

d. none of the above

5. Concurrency in DBMS means

e) The restoration of the databases after any type of failure

f) More than one user can access the same data items at the same time.

g) More than one user can change the same data item at the same time.

h) No more than one user can access the same data items at the same time.

6. On an entity-relationship diagram, a diamond represents a(n):

- a. repeating group.
- b. multivalued attribute.
- c. entity.
- d. relationship.

7. A person, place, object, event, or concept in the user environment about which the organization wishes to maintain data refers to a(n):

- a. attribute.
- b. data element.
- c. relationship.
- d. entity.

Data Structures

1. In a linked list implementation of a queue, which of these pointers will change during an insertion into an empty queue ?

- a. Only front-pointer changes.
- b. Only rear-pointer changes.
- c. Neither front-pointer nor rear-pointer changes.
- d. Both pointers change.

2. One difference between a queue and a stack is :

- a. A queue requires dynamic memory, but a stack does not.
- b. A stack requires dynamic memory, but a queue does not.
- c. A queue uses two ends of the linear structure, while a stack uses only one.
- d. A stack uses two ends of the linear structure, while a queue uses only one.

3. A linked stack is full when :

- a. `count == max_stack_size`
- b. Dynamic memory is full.
- c. `new` operator fails to allocate new memory.
- d. `count > max_stack_size`

4. A linked queue contains exactly one element when :

- a. rear == NULL;
- b. front == NULL;
- c. rear == front;
- d. count == 1;

5. Which of the following is not a part of a definition of any ADT :

- a. List of operations that work with objects of a given data type
- b. Name of the operation
- c. Time and memory limits for each operation
- d. Description of the operation parameters and the type of these parameters

6. Which of the following is not an operation in class queue :

- a. PUSH
- b. RETRIEVE
- c. APPEND
- d. none of the above

7. The average number of comparisons required to insert an element in a dynamic stack of size n is:

- a. $O(\log \log n)$
- b. $O(n)$
- c. $O(n \log n)$
- d. $O(1)$

8. The height of the binary search tree is:

- a. The number of nodes in the left subtree
- b. The number of nodes in the right subtree
- c. The total number of nodes in the tree
- d. The number of nodes on the longest path in the tree

9. The circular queue design is used in implementing:

- a. An array stack
- b. A linked stack
- c. A linked queue
- d. An array queue

Discrete Math

1- A theorem $A \Rightarrow B$ is :

- (a) a contradiction statement that can be proved
- (b) a tautological statement that can be proved
- (c) a contingency statement that can be proved
- (d) a contingency statement that cannot be proved

2 - Let $X = \{1, 5, \pi, \sqrt{3}, e, 11\}$ and τ is a partition of X defined by :

$$\tau = \left\{ \{5, \pi, 11\}, \{1, e\}, \{\sqrt{3}\} \right\} \text{ then the equivalence relation } R$$

in X produced by τ is

- (a) $R = I_X$
- (b) $R = I_X \cup \{(5, 11), (11, 5), (5, \pi), (\pi, 5), (\pi, 11), (1, e), (e, 1)\}$
- (c) $R = I_X \cup \{(5, 11), (11, 5), (5, \pi), (\pi, 5), (\pi, 11), (11, \pi), (1, e), (e, 1)\}$
- (d) $R = I_X \cup \{(5, 11), (11, 5), (\pi, 5), (\pi, 11), (11, \pi), (1, e)\}$

3 - Let $X = \{a, b, c, d, e, f\}$ and τ is a partition of X defined by :

$$\tau = \left\{ \{a, b, c\}, \{d, f\}, \{e\} \right\} \text{ then the equivalence relation produced}$$

by R on X is

- (a) $R = I_X = \{(a, a), (b, b), (c, c), (d, d), (e, e), (f, f)\}$
- (b) $R = I_X \cup \{(a, b), (b, a), (c, b), (b, c), (c, a), (a, c), (d, f), (f, d)\}$

$$(c) R = I_X \cup \{(a,b), (b,a), (c,d), (d,c), (c,e), (e,c), (d,b), (b,d)\}$$

$$(d) R = I_X \cup \{(a,b), (b,a), (c,d), (d,c), (c,f), (f,c), (d,e), (e,d)\}$$

4- Let (A, R) be a partially ordered set, let $a \in A$ then a is greatest element of A if

$$(a) x > a \Rightarrow x = a$$

$$(b) a \leq x, \forall x \in A$$

$$(c) x \leq a, \forall x \in A$$

$$(d) x < a \Rightarrow x = a$$

5- Assume that A is a set and $R \subseteq A \times A$ then R is an equivalence relation in A if and only if :

$$(a) I_A \subseteq R$$

$$(b) R^{-1} = R$$

$$(c) R \circ R \subseteq R$$

(d)

$$I_A \subseteq R \wedge R^{-1} = R \wedge R \circ R \subseteq R$$

6- Assume that (A, R) totally ordered set, then (A, R) is well ordered set if and only if :

$$(a) \forall X \subseteq A, X \neq \emptyset, \exists a \in X : a \leq x, \forall x \in X$$

$$(b) \forall X \subseteq A, X \neq \emptyset, \exists a \in X : a \leq x, \forall x \in X$$

$$(c) \forall X \subseteq A, X \neq \emptyset, \exists a \in X : a \geq x, \forall x \in X$$

$$(d) \forall X \subseteq A, X \neq \emptyset, \exists a \in X : x > a \Rightarrow x = a$$

7- If a graph G has $n = 21$ vertices 5 of them each has degree 6 and the

remaining vertices each has degree 2 then the number of edges of G is :

(a) There is no graph G with those properties because sum of degrees of all vertices of G is even

(b) 62

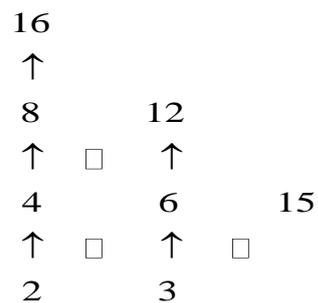
(c) 21

(d) 31

8- Let $A = \{ 2, 3, 4, 6, 12, 15, 16 \}$ and

$R = \{ (x, y), x, y \in A \wedge x | y \}$, consider Hasse diagram of

the partially ordered set (A, R) :



Let $B = \{ 2, 4, 6, 12 \} \subseteq A$, then

(a) $\text{Inf } B \wedge \text{Sup } B$ are 3, 16

(b) $\text{Inf } B \wedge \text{Sup } B$ are 2, 12

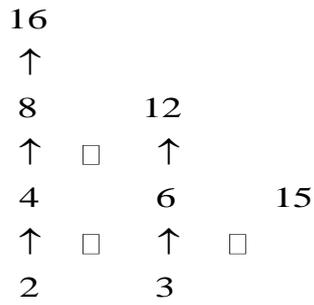
(c) $\text{Inf } B \wedge \text{Sup } B$ are 12, 15

(d) $\text{Inf } B \wedge \text{Sup } B$ is 20

9- Let $A = \{ 2, 3, 4, 6, 12, 15, 16 \}$ and

$R = \{ (x, y), x, y \in A \wedge x | y \}$, consider Hasse diagram of

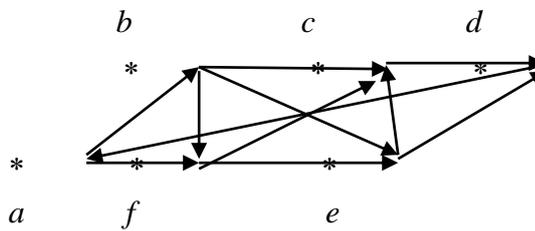
the partially ordered set (A, R) :



Let $B = \{2, 3, 4, 6, 12, 15\} \subseteq A$, then

- (a) B has greatest element 15
- (b) Least elements of B are 2, 3
- (c) Minimal elements of B are 2, 3
- (d) Least element of B is 2

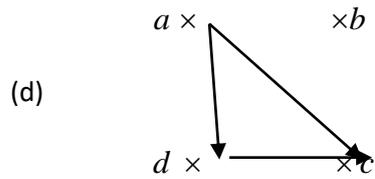
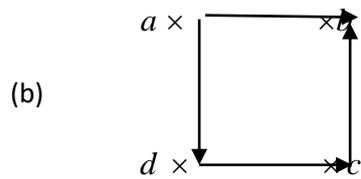
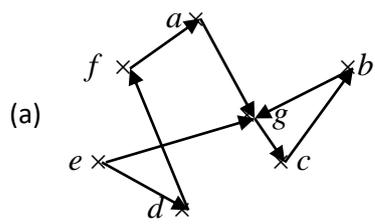
10- Consider the directed graph $G = (V, E)$,



then $\deg^+ a$, $\deg^- d$ are:

- (a) 2, 0
- (b) 3, 2
- (c) 2, 2
- (d) 1, 3

11- Strongly connected graph is :



Internet programming

1) Which of the following is not an attribute of the **TABLE** element?

(a) **WIDTH**

(b) **BORDER**

(c) **CAPTION**

(d) **ALIGN**

2) **METHOD = "get"** should be used when

(a) updating a database.

(b) the form data must be sent as an environment variable.

(c) special characters must be submitted.

(d) making a database request.

3) What attribute is always required by the **INPUT** element?

(a) **TYPE**

(b) **VALUE**

(c) **SIZE**

(d) **MAXLENGTH**

4) Which of the following attributes should always be included in an input element?

(a) **SIZE**

(b) **VALUE**

(c) **MAXLENGTH**

(d) **NAME**

5) Which of the following is not a valid input type?

(a) **select**

(b) **radio**

(c) **checkbox**

(d) **password**

6) _____ was originally created by _____.

a) JScript, Netscape

b) JScript, ECMA

c) JavaScript, Microsoft

(d) **JavaScript, Netscape**

7) Consider the following script. What is wrong with the following code?

```
1 <SCRIPT LANGUAGE = "JavaScript">
2 var firstNumber,
3 secondNumber;
4 thirdNumber;
5
6 thirdNumber =
7 parseInt( window.prompt( "Enter an integer", 0 ) );
8 document.write( thirdNumber );
9 </SCRIPT>
```

- a) **thirdNumber** in line 8 must be in quotes.
- b) The words **Enter an integer** in line 7 should not be in quotes.
- c) The word **var** must be placed before **secondNumber** in line 3.
- d) The word **var** must be placed before **thirdNumber** in line 4.

8) A **META** element with **NAME = "description"**

- (a) should contain a list of keywords.
- (b) is not used by search engines.
- (c) should contain a few sentences about the Web site.
- (d) is displayed by the browser.

9) Microsoft's version of scripting that uses the Java syntax is called _____.

- a) JavaScript
- b) JScript
- c) ECMAScript
- d) J++

10) Which of the following are declared correctly?

```
a) for (var i=0;i<100;i++ ) [  
statement;  
]
```

```
b) for (var i=0;i<100;++i ) [  
statement;  
}
```

```
c) for (var i=0;i<100;++i ) {  
statement;  
}
```

```
d) for (var i=0;i<100;++i; ) {  
statement;  
}
```

Java Language

1. What is the result of attempting to compile and run the program?

```
class A {  
    String s1 = "A.s1"; String s2 = "A.s2";  
}  
class B extends A {  
    String s1 = "B.s1";  
    public static void main(String args[]) {  
        B x = new B(); A y = (A)x;  
        System.out.println(x.s1+" "+x.s2+" "+y.s1+" "+y.s2);  
    }  
}
```

a. Prints: B.s1 A.s2 B.s1 A.s2

b. Prints: B.s1 A.s2 A.s1 A.s2

c. Prints: A.s1 A.s2 B.s1 A.s2

d. Prints: A.s1 A.s2 A.s1 A.s2

2. A compile-time error is generated at which line?

```
class MCZ31 {  
    public static void main (String[] args) {  
        char a = '\t'; // 1  
        char b = '\\'; // 2  
        char c = '\"'; // 3  
        char d = '\"'; // 4  
        char e = '?'; // 5  
    }  
}
```

- a. 1
- b. 2
- c. 3
- d. 4**

3. What is the result of attempting to compile and run the program?

```
class MCZ13 {  
    public static void main (String[] args) {  
        String s = null;  
        System.out.print(s);  
    }  
}
```

- a. Prints nothing.
- b. Prints: null**
- c. Compile-time error
- d. Run-time error

4. A compile-time error is generated at which line?

```
class MCZ15 {  
    public static void main (String[] args) {  
        float a = 1.1e1f; // 1  
        float b = 1e-1F; // 2  
        float c = .1e1f; // 3  
        double d = .1d; // 4  
        double e = 1D; // 5  
    }  
}
```

- a. 1
- b. 2
- c. 4
- d. none of the above.**

5. A class can not be called "tightly encapsulated" unless which of the following is true?

- a. The class is declared final.
- b. All local variables are declared private.**
- c. All method parameters are declared final.
- d. None of the above

6. Which class declaration results in a compile-time error?

```
class Z {  
    abstract class A {} // 1  
    final class B {} // 2  
    private class C {} // 3  
    protected class D {} // 4  
    public class E {} // 5  
}
```

- a. 1
- b. 2
- c. 3
- d. None of the above**

7. Which of the following is a true statement?

- a. An anonymous class can extend only the Object class.**
- b. An anonymous class can not implement an interface.
- c. An anonymous class declaration can not have an implements clause.
- d. An anonymous class declaration can name more than one interface in the implements clause

8. Which variable can not be substituted for ??? without causing a compile-time error?

```
class A {  
    private static String s1 = "s1";  
    final String s2 = "s2";  
    A () { new Z("s5", "s6"); }  
    class Z {  
        final String s3 = "s3";  
    }  
}
```

```

String s4 = "s4";
Z (final String s5, String s6) {
    System.out.print(???);
}
}
public static void main(String args[]) { new A();
}

```

- a. s1
- b. s2
- c. s3
- d. None of the above

9. In a linked list implementation of a queue, which of these pointers will change during an insertion into an empty queue ?

- e. Only front-pointer changes.
- f. Only rear-pointer changes.
- g. Nither front-pointer nor rear-pointer changes.
- h. Both pointers change.

10.

```

class MWC201 {
    public static void main(String[] args) {
        int[][] a1 = {{1,2,3},{4,5,6},{7,8,9,10}};
        System.out.print(a1[0][2]+","+a1[1][0]+","+a1[2][1]);
    }
}

```

What is the result of attempting to compile and run the program?

- a. Prints: 3,4,8
- b. Prints: 7,2,6
- c. Compile-time error
- d. Run-time error

11. package com.dan.chisholm;

```

public class A {
    public void m1() {System.out.print("A.m1, ");}
    protected void m2() {System.out.print("A.m2, ");}
    private void m3() {System.out.print("A.m3, ");}
    void m4() {System.out.print("A.m4, ");}
}

```

```

}
class B {
    public static void main(String[] args) {
        A a = new A();
        a.m1(); // 1
        a.m2(); // 2
        a.m3(); // 3
        a.m4(); // 4
    }
}

```

Assume that the code appears in a single file named A.java. What is the result of attempting to compile and run the program?

- a. Prints: A.m1, A.m2, A.m3, A.m4,
- b. Compile-time error at 1.
- c. Compile-time error at 2.
- d. Compile-time error at 3.

Network Planning and Administration

Q1 - Which of the following operating systems is (are) open source

- A. Mac OS ver. 10.6
- B. Solaris Ver. 10
- C. MS 2008 R12
- D. All the above

Q2 - Which of the following is a function of DHCP

- a- Assign IP addresses
- b- Assign Physical Addresses
- c- Assign Port addresses
- d- All the above

Q3 - Which of the following procedures is (are) part of the post-installation process

- a. Set the computer name
- b. Configure the IP address
- c. Add roles and features
- d. All of the above

Q4 – When you buy server OS, Microsoft requires _____ (CAL).

- a. Configuration AD List
- b. Client Access List

- c. **Client Access License**
- d. Creation of AD License

Q5 – A Domain Controller (DC) is a server

- a) allowing users in the network to run and use web applications
- b) that is responsible for allowing host access to domain resources**
- c) used to store websites
- d) Not a part of AD

System Analysis and Design:

1. Which of the following Information systems are aimed at improving the routine business activities on which all organizations depend?

- (a) Management Information systems
- (b) Decision support systems
- (c) Transaction processing systems**
- (d) Management support systems
- (e) Transaction Information systems.

2. Which of the following strategies are adopted if information requirements are not well-defined?

- (a) Rapid application development method
- (b) Structured analysis development method
- (c) Systems development life cycle method
- (d) Prototyping method**
- (e) Spiral method.

3. Structured Programming involves:

- (a) functional modularization**
- (b) localization of errors
- (c) decentralized programming
- (d) stress on analysis
- (e) stress on requirements gathering.

4. Which of the following is not a fact-finding technique?

- (a) Third party enquiry**
- (b) Interview
- (c) Questionnaire
- (d) Record reviews
- (e) Observation.

5. Which of the following questions are useful in evaluating data flow diagrams?

- (a) Are there any unnamed components in the data flow diagram?
- (b) Are there any processes that do not receive input?
- (c) Are there any data stores that are input but never referenced?

- (d) Both (a) and (b) above
- (e) All (a), (b) and (c) above.

6. In system design and development field what does spaghetti code mean?

- (a) programs written in unstructured languages.
- (b) well structured and well documented code.
- (c) program code that has many GOTO statements.
- (d) Both (a) and (c) above
- (e) Both (b) and (c) above.

7. Which of the following statements is false with respect to a Data Dictionary?

- (a) It is a repository of the elements in a system.
- (b) data dictionary and data store both are same
- (c) It manages detail
- (d) It communicates the common meanings for system elements and activities.
- (e) It documents system features.

8. Match the following and select the correct options given under

- i) physical design A) Documentation
- ii) interview B) Type of output
- iii) Input design C) defines design specifications that are to be coded
- iv) Installation procedure D) a data gathering technique
- v) report E) Identification and design of interfaces to enter data

- (a) i-D, ii – A, iii-B, iv – C, v- E
- (b) i-C, ii – D, iii-E, iv – A, v- B
- (c) i-A, ii – D, iii-B, iv – C, v- E
- (d) i-D, ii – A, iii-E, iv – B, v- C
- (e) i-B, ii – A, iii-D, iv – C, v- E.

9. Cost-Benefit Analysis is performed during

- (a) Analysis phase
- (b) Design phase
- (c) Feasibility study phase
- (d) Implementation phase
- (e) Maintenance phase.

Wireless Application Networks

1- The Definition of Loaders is:

- A) loaders make it easy to synchronously load data in an activity or fragment.
- B) loaders make it easy to asynchronously load data in an activity or fragment.
- C) loaders does not make it easy to asynchronously load data in an activity or fragment.
- D) none of the above.

2- Which are the screen sizes in Android?

- A) small
- B) normal
- C) large
- D) all of the above

3- What is the difference between Activity context and Application Context?

- A) The Activity instance is tied to the lifecycle of an Activity. while the application instance is tied to the lifecycle of the application.
- B) The Activity instance is tied to the lifecycle of the application, while the application instance is tied to the lifecycle of an Activity.
- C) The Activity instance is tied to the lifecycle of the Activity, while the application instance is tied to the lifecycle of an application.
- D) none of the above

4- Parent class of Activity?

- A) object
- B) context
- C) activityGroup
- D) contextThemeWrapper

5- You can shut down an activity by calling its _____ method

- A) onDestory()
- B) finishActivity()
- C) finish()
- D) none of the above

6- Layouts in android?

- A) Frame Layout
- B) Linear Layout
- C) Relative Layout
- D) All of the above

7- What year was the Open Handset Alliance announced?

- A) 2005
- B) 2006
- C) 2007
- D) 2008

8- If the UI begins to behave sluggishly or crash while making network calls, this is likely due to...

- A) Network latency
- B) Hardware malfunctions
- C) Virus on the Server
- D) Activity manager contains too much.

9- The XML file that contains all the text that your application uses.

- A) stack.xml
- B) text.xml
- C) strings.xml
- D) string.java

10- Dialog classes in android?

- A) AlertDialog
- B) ProgressDialog
- C) DatePickerDialog
- D) All of the above

11- How is a simulator different from an emulator?

- A) Emulators are only used to play old SNES games, simulators are used for software development
- B) The emulator is shipped with the Android SDK and third party simulators are not

- C) The emulator can virtualize sensors and other hardware features, while the simulator cannot
- D) The emulator imitates the machine executing the binary code, rather than simulating the behaviour of the code at a higher level

12- Creating a UI (User Interface) in Android requires careful use of...

- A) Java and SQL
- B) XML and Java
- C) XML and C++
- D) Dream weaver

13- What file is responsible for glueing everything together, explaining what the application consists of, what its main building blocks are, ext....?

- A) Layout file
- B) Strings XML
- C) R file
- D) Manifest file

14- The Emulator is identical to running a real phone EXCEPT when emulating/simulating what?

- A) Telephony
- B) Applications
- C) Sensors
- D) The emulator can emulate/simulate all aspects of a smart phone.

15- Intents:

- A) are messages that are sent among major building blocks
- B) trigger activities to being, services to start or stop, or broadcast
- C) are asynchronous
- D) all of those

16- What built-in database is Android shipped with?

- A) SQLite
- B) Apache
- C) MySQL
- D) Oracle

17- The emulated device for android

- A) Runs the same code base as the actual device, all the way down to the machine layer
- B) Is more of a simulator, and acts as a virtual machine for the Android device
- C) Runs the same code base as the actual device, however at a higher level
- D) An imaginary machine built on the hopes and dreams of baby elephants

18- What was the first phone released that ran the Android OS?

- A) Google gPhone
- B) T-Mobile G1
- C) Motorola Droid
- D) HTC Hero

19- What is a funny fact about the start of Android?

- A) It was originally going to be called UFO
- B) The first version of Android was released without an actual phone on the market
- C) Androids main purpose was to unlock your car door when you left the keys inside of it
- D) Was going to be a closed source application to make more money for its company

20- When an activity doesn't exist in memory it is in

- A) Starting state

- B) Running state
- C) Loading state
- D) Inexistent state

IDCN

1) Which of the following is a port address?

- a) 123
- b) P123
- c) 01111011
- d) C4

2) Which of the following is a reliable protocol?

- a) IP
- b) TCP
- c) UDP
- d) All the above

3) Cable is used for voice and data communications with minimum cost is

- A) Twisted pair.
- B) Coaxial.
- C) Fiber Optic.
- D) None of the above.

4) Bit interval is a term that is used to describe:

- A) The time required to send one single bit
- B) The number of bits sent in one second
- C) The rate at which the signal repeats
- D) The amount of time it takes for one repetition

Visual Programming:

1) Which is true about the name and text property of a control?

- A. The text property changes to match any changes in the name property.
- B. They are the same when the control is first created.
- C. They are never the same unless the programmer makes it that way.
- D. The name property changes to match any changes in the text property.

2) An object is composed of:

- A. Properties
- B. Events
- Methods
- C.
- All of the above
- D.

3) Which statement about objects is true?

- A. One class is used to create one object.
- B. One class can create many objects.
- C. One object is used to create one class.
- D. One object can create many classes.

4) Using a _____ variable does not enable us to create read-only properties that are often required by a class.

- A. private
- B. public
- C. Friend
- D. protected

5) A _____ performs invisible tasks even if you write no code.

- A. Destructor
- B. constructor
- C. Function
- D. private method

Technical Writing

1. Editing for consistency and accuracy is performed during:

- a. Planning phase
- b. Drafting phase
- c. Finalizing phase
- d. None

2. The three elements in problem statement are:

- a. Planning, organization, and managing
- b. The problem, the method of solving, and the purpose**
- c. Audience, scope, solving methodology
- d. None is correct

3. Audience considerations when writing a document:

- a. Audience type and expertise
- b. Audience purpose in using the document
- c. Audience attitude
- d. All are correct**

4. The rate of information presented to the reader is:

- a. Document density**
- b. Document details
- c. Document complexity
- d. All are correct

5. The part of memos which is used to outline the message in a very accessible and transparent way is:

- a. Heading
- b. Body**
- c. Detail
- d. None is correct

Software Engineering:

1-What happens in the maintenance stage of the Software Development Life Cycle (SDLC)?

- a. Change the software according to new customer requests**

- b. Define the main structure of the code
- c. Write software code
- d. Make sure that the code meets requirements

2-Project management concerns with activities of scheduling and cost.

- a. True
- b. False

3-Maintenance to adapt the software to a different operating environment is called: corrective maintenance.

- a. True
- b. False

4-Which of the following statements is correct about CASE?

- a. CASE tools are software programs.
- b. CASE tools do not allow the translation of system models into programs.
- c. CASE products require high performance machines.
- d. CASE tools complicate the system development process.

5-What happens in the design stage of the Software Development Life Cycle (SDLC)?

- a. Analyze requirements
- b. Make sure that the code meets requirements
- c. Collect requirement from stakeholders
- d. Decide the best solution for the collected requirement

6-A deliverable is an end-point of a software process activity.

- a. True
- b. False

7-In which phase of the software development life cycle requirements specification document is written?

- a. implementing System
- b. Requirements Engineering
- c. Designing the System
- d. Testing and Maintaining the System

8-Which statement about a prototype is true?

- A. It is a functional model of the entire system.

- B. It is the complete untested product ready for final review by the customer.
- C. It is necessary in order to verify that the software is progressing according to what the customer wants.
- D. It is an executable file for the entire system

9- Which of the following techniques is used to elicit requirements?

- A. Scenarios
- B. Object model
- C. Functional model
- D. System Model

10- Which statement best describe a meaning of "waterfall" life cycle model.

- A. When a phase in the lifecycle is executed continuously without stop.
- B. When a phase in the lifecycle iterates like a ring on the spiral, moving outward from the center.
- C. When a phase in the lifecycle overlapping with each others.
- D. When a phase in the lifecycle is completed, the results fall down to the next phase and there is no going back.

11- Project risk factor is considered in ?

- A. Iterative enhancement model
- B. Prototyping model
- C. Spiral model
- D. Waterfall model

12- Techniques developed to keep the analysis effort minimal, yet still effective include:

- A. JAD
- B. interviewing
- C. observations
- D. quiz sessions

Information System Management:

1. Which wave of innovation shifted attention to produce revenue by gaining a strategic advantage?

- a) Wave 1: Reducing costs
- b) Wave 2: Leveraging investments
- c) Wave 3: Enhancing products and services**
- d) Wave 4: Enhancing executive decision making

2. Which wave of innovation focused on changing the fundamental structure of an organization ?

- a) Wave 1: Reducing costs
- b) Wave 2: Leveraging investments
- c) Wave 3: Enhancing products and services
- d) Wave 4: Enhancing executive decision making**

3. Which wave of innovation focused on achieving clerical and administrative savings by automating manual processes?

- a) Wave 1: Reducing costs**
- b) Wave 2: Leveraging investments
- c) Wave 3: Enhancing products and services
- d) Wave 4: Enhancing executive decision making

4. The traditional set of IS responsibilities includes all of the following except:

- a) Managing corporate data
- b) Planning systems
- c) Identifying opportunities for network expansion**
- d) Performing system analysis and design

5. -----is a pervasive element of society today and has revolutionized and restructured many aspects of human endeavor, including work.

- a) Information systems
- b) Management Information Systems
- c) Information System Management
- d) Information Technology**

6. The IS Lite model suggests that today's IS department should concentrate on:

- a) Driving innovation.
- b) Managing supplier and user relationships

c) Developing website content .

d) Both A and B

7. During the distributed era, which role did the CIO have to take on?

a) organizational designer

b) technology architect

c) informed buyer

d) All of the above

8. Which of the following is a method that a CIO could use to learn more about the business ?

a) sponsor weekly briefings

b) read industry publications

c) partner with a line executive

d) All of the above

9. Governance differs from management in that :

a) governance is about why decisions are made, whereas management is about deciding who makes decisions

b) governance is about when decisions are made, whereas management is about deciding why decisions are made .

c) governance is about making decisions once decision rights have been assigned, whereas management is about deciding who makes decisions .

d) governance is about deciding who makes decisions, whereas management is about making decisions once decision rights have been assigned.

ERP course:

1- With ERP software, the GUI can take the form of a dashboard customized to suit the needs and preferences of a set of users or a specific user.

a- True

b- False

2- One of these is not of the Back-Office software of ERP:

a- HR.

b- Financials.

c- Customer relationship management.

d- Operations.

- 3- Changing a software code called:
- a- Customization.
 - b- Configuration.
 - c- Vanilla installation.
 - d- None of them.
- 4- The focus of BPR is not on *Why* a process is done, but *HOW* it is done
- a- True.
 - b- False.
- 5- One of these is not an advantage of Clean Slate Reengineering:
- a- Evolution is not limited by a particular technology.
 - b- Excess time and resources.
 - c- Not constrained by a particular tool.
 - d- Not constrained to a limited set of processes.
- 6- One of these is not an advantage of Technology-Enabled Reengineering:
- a- ERP provides the tool and structure to facilitate change.
 - b- ERP bounds the design which eliminates difficult decisions.
 - c- Design is feasible and we know it works (it's been proven).
 - d- Constrained by a technology, evolution limited by that technology, limited by certain best practices in that technology.
- 7- Lessons Learned through Business Process Reengineering.
- a- Low cost labor.
 - b- Scalability – both up and down.
 - c- Recognize that a process is just one aspect of success.
 - d- All of them.
- 8- A process map, also known as a cross-functional flowchart:
- a- True.
 - b- False.
- 9- Bottlenecks process Problem means:
- a- A number of process flows lead to a single activity.

- b- People spending time fixing errors or remediating problems.
- c- People not knowing what they are responsible for and others do.
- d- time between activities can be measured to identify substantial contributors to delay and underutilization.

10- Transferring of responsibility from one role to another is a process problem called:

- a- Bottlenecks.
- b- Rework.
- c- Handoffs.**
- d- Data duplication.