

**COMPUTER SCIENCE
FOR CAPE
UNIT 2
PAPER 1 PAST PAPERS**

BATCH #5

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1. A queue is a data structure in which elements

- (A) can only be added to the front and removed from the rear
- (B) can only be added and removed from the rear
- (C) can only be added and removed from the front
- (D) can only be added to the rear and removed from the front

2. In a binary search

- (A) the number of items being searched is halved on every iteration
- (B) the list of data items is searched randomly
- (C) the list of data items is searched one by one until the target is found or the list is exhausted
- (D) the list of data items may be unordered

3. Which of the following is true for BOTH a linear search and binary search?

- (A) On average they search half the list.
- (B) In the worst case scenario they search the entire list.
- (C) They can be used for searching an ordered list.
- (D) They require that the list be ordered.

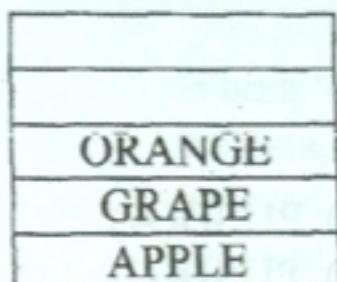
4. Which of the following statements is TRUE with regard to a binary search?

- (A) It can be used on linked lists.
- (B) It generally makes fewer comparisons than linear search.
- (C) On average half the list is searched.
- (D) It can be used on unordered lists but performs poorly.

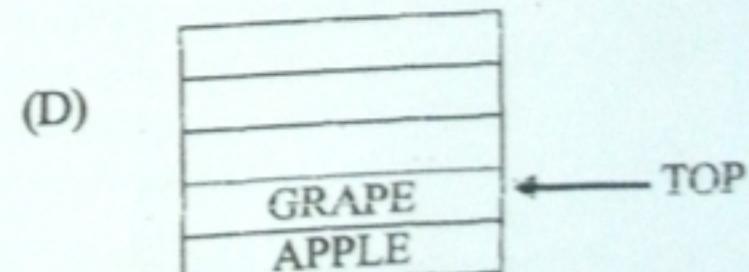
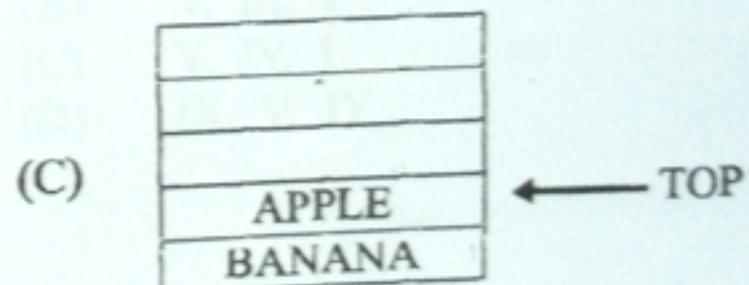
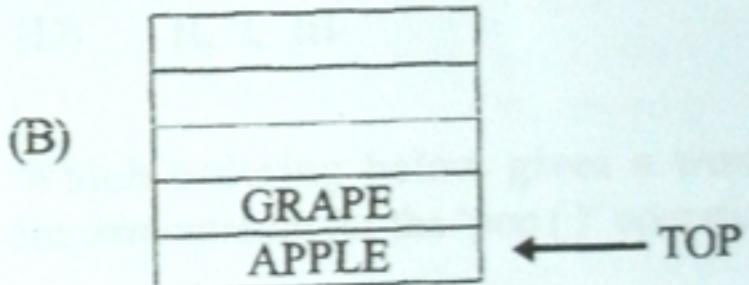
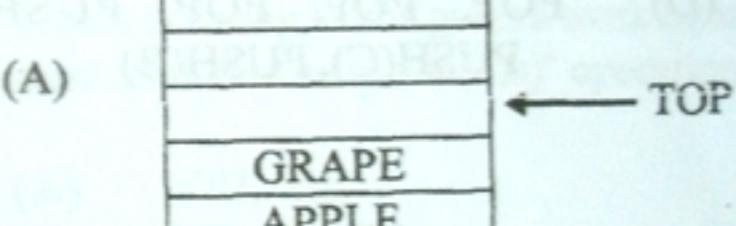
5. Which of the following statements is TRUE?

- (A) The bubble sort performs better than selection sort on longer lists.
- (B) The selection sort performs better on a partially ordered list than a completely unordered list.
- (C) The selection sort takes the same amount of time regardless of the nature of the list.
- (D) The bubble sort is very simple and therefore very efficient.

6. The diagram below shows three items stored in a stack. Which diagram gives the state of the stack after the operations listed are performed in order?

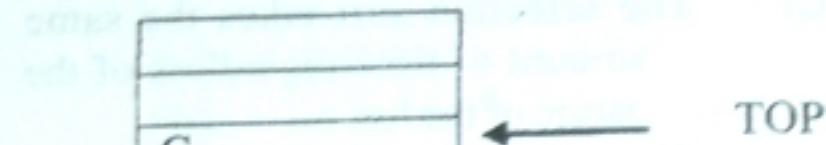


Operations:
PUSH (BANANA)
POP
POP



7. The diagram below shows three items stored in a stack. Which sequence of operations would transform the stack from the initial state to the final state shown below?

Initial State



Final State



- (A) POP, POP, PUSH(C), PUSH(A)
- (B) POP, POP, PUSH(A), PUSH(C)
- (C) PUSH(A), PUSH(C), POP, POP
- (D) POP, POP, POP, PUSH(A),
PUSH(C), PUSH(B)

8. Using the selection sort algorithm what would the array below look like after 3 passes?

| | | | | | | |
|----------|----|----|----|---|---|---|
| 30 | 32 | 24 | 18 | 7 | 3 | |
| POSITION | 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|----------|---|---|----|----|----|----|
| (A) | 3 | 7 | 18 | 30 | 32 | 24 |
| POSITION | 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|----------|---|---|----|----|----|----|
| (B) | 3 | 7 | 24 | 18 | 30 | 32 |
| POSITION | 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|----------|---|---|----|----|----|----|
| (C) | 3 | 7 | 18 | 24 | 32 | 30 |
| POSITION | 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|----------|---|---|----|----|----|----|
| (D) | 3 | 7 | 18 | 24 | 30 | 32 |
| POSITION | 0 | 1 | 2 | 3 | 4 | 5 |

9. In which of the following situations would the implementation of a queue be most appropriate?

- (A) To store information when functions are called
- (B) Computer language translation
- (C) Scheduling CPU time for processes using Round Robin
- (D) Evaluating reverse polish mathematical expressions

Item 10 refers to the array below which uses the binary search algorithm. When searching for the value 9 in the array below using a binary search, which part of the array will be of interest after the first comparison is made (i.e. after the target value 9 is compared with the middle item 14)?

10.

| | | | | | | |
|---|---|---|----|----|----|----|
| 1 | 6 | 9 | 14 | 17 | 20 | 22 |
|---|---|---|----|----|----|----|

- (A)

| | | | |
|---|---|---|----|
| 1 | 6 | 9 | 14 |
|---|---|---|----|
- (B)

| | | |
|---|---|---|
| 1 | 6 | 9 |
|---|---|---|
- (C)

| | | |
|----|----|----|
| 17 | 20 | 22 |
|----|----|----|
- (D)

| | |
|---|---|
| 6 | 9 |
|---|---|

Item 11 below refers to a segment of an algorithm for performing a selection sort on an array *list* in ascending order.

```

FOR i = 0 to n-2 DO
    min = i
    FOR j = i + 1 to n-1 DO
        IF I THEN
            min = j
        END IF
        SWAP list[i] and II
    END FOR
END FOR

```

11. Which sequence of the following steps would correctly complete the algorithm?

- (A) I - list[j] < list[min]
II - list[min]
- (B) I - list[j] > list[min]
II - list[min]
- (C) I - list[j] < list[min]
II - list[j]
- (D) I - list[j] > list[min]
II - list[j]

Items 12 - 13 refer to the following scenario.

A student is asked to implement a Stack using arrays. The student develops the following operations and programming statements.

Operation:
push(ele)
pop()

- I. return ele
- II. if ptr != array_size
- III. ptr = ptr + 1
- IV. ptr = ptr - 1
- V. ele = data [ptr]
- VI. ele = data [ptr + 1]
- VII. data [ptr] = ele
- VIII. data [ptr - 1] = ele
- IX. if (ptr != 0)

Where 'data' refers to the array which stores the data, 'ptr' is the address of the last element inserted into the Stack and 'ele' is the data element being acted on.

12. Which ordering below gives a working implementation for the 'push (ele)' operation?

- (A) VIII, III, I
- (B) VII, IV, II
- (C) II, III, VII
- (D) II, I, III

13. Which ordering below gives a working implementation for the 'pop ()' operation?

- (A) VI, IV, II
- (B) V, III, I
- (C) V, IV, I
- (D) IX, V, IV

14. A software firm is designing a program to simulate the arrival and departure of customers at a supermarket check-out counter. Which of the following data structures is the MOST appropriate to achieve this objective?
- (A) Stack
 (B) Queue
 (C) Array
 (D) Tree
15. Consider a circular queue, Q, with two pointers **front** and **rear**. The head of the queue is referenced by **front** and the tail of the queue by **rear**. Assuming that the locations range from 0 to 4, what is the value of the pointer **front**, after performing the following operations on the queue?
- enqueue, enqueue, enqueue, dequeue, dequeue, enqueue, enqueue, dequeue**
- (A) 0
 (B) 1
 (C) 2
 (D) 3
16. Software that is NOT associated with the wasting of resources is said to have the property of
- (A) reliability
 (B) efficiency
 (C) dependability
 (D) usability
17. A feasibility study
- (A) describes a cost effective means of developing the proposed system
 (B) discusses whether the proposed system will be cost effective
 (C) is usually a lengthy and costly process
 (D) describes how current software and hardware can be used to develop
18. Which of the following design processes refers to the identification of subsystems and their relationships?
- (A) Architectural
 (B) Component
 (C) Data structure
 (D) Interface
19. One of the MAIN weaknesses of the waterfall model is that it
- (A) requires significant technical support
 (B) encourages increase in project size
 (C) is a highly inflexible development model
 (D) consumes a lot of time and resources
20. Which of the following are the essential features of a well-engineered software?
- (A) Security, portability, efficiency, usability
 (B) Maintainability, dependability, efficiency, usability
 (C) Reusability, security, maintainability, portability
 (D) Reliability, user friendliness, efficiency, portability
21. Which of the following is considered a functional requirement?
- (A) Security
 (B) Availability
 (C) Inputs
 (D) Response time

22. Which of the following BEST describes software evolution?

- (A) Where a system is improved by addressing bugs
- (B) Where a new system is developed from an existing system
- (C) Where software automatically adapts to changing customer needs and wants
- (D) Where software is modified to satisfy changes in customer and market requirements

23. Which of the following activities is NOT common to all software processes?

- (A) Validation
- (B) Evolution
- (C) Specification
- (D) Transformation

24. End users should be involved in the software development process

- (A) so they do not feel their job is threatened
- (B) because they are more likely to use the product if they are included
- (C) to communicate needs and wants
- (D) because managers have less time to interact with developers

25.

A company with many employees and branches located in various Caribbean territories is interested in replacing their existing software system with a new system. What approach is MOST appropriate for gathering information during the analysis phase?

- (A) Prototyping
- (B) Distributing questionnaires at each branch
- (C) Observation of practices at a few branches
- (D) Interviews with key people at a few branches

26.

Which life cycle model approach is BEST suited to a system with critical safety and security requirements?

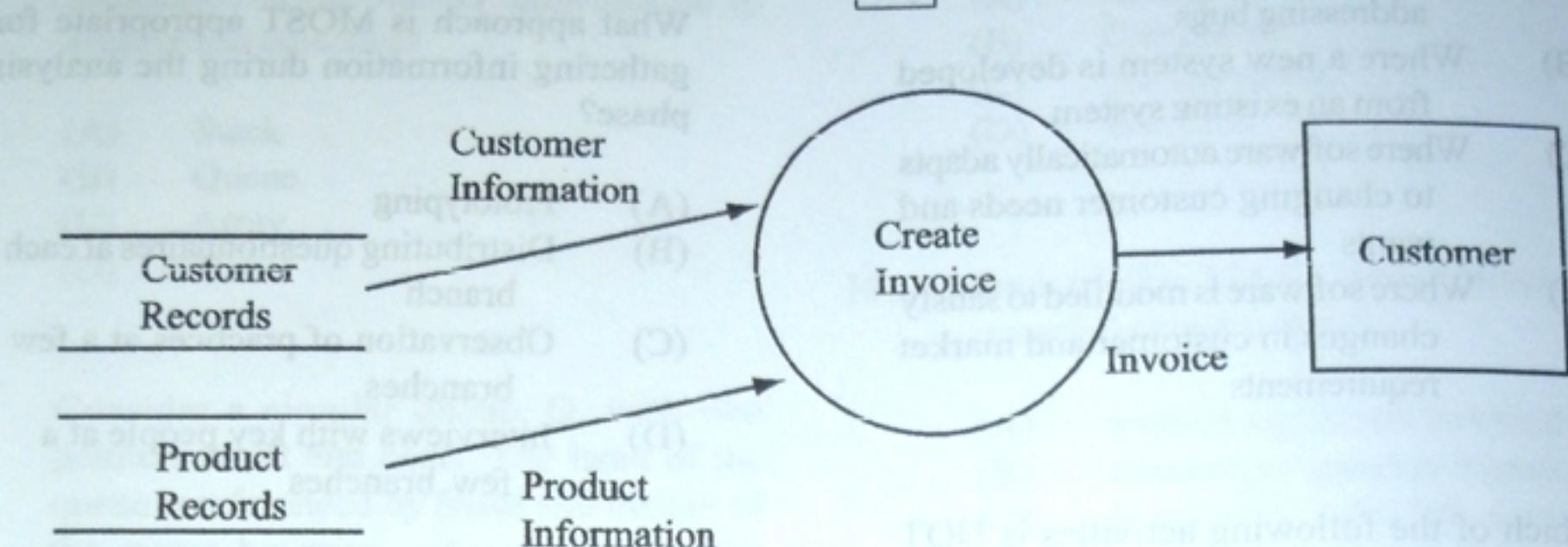
- (A) Waterfall approach, since software is well structured
- (B) Evolutionary development, since any security problems can be easily rectified by creating a new system
- (C) Fountain approach, since any security problems can be easily rectified by further iterations
- (D) Formal transformation, since it can be proven that the system fulfills requirements

Items 27 -28 refer to a data flow diagram below which utilizes the following symbols.

Process: ○

File: _____

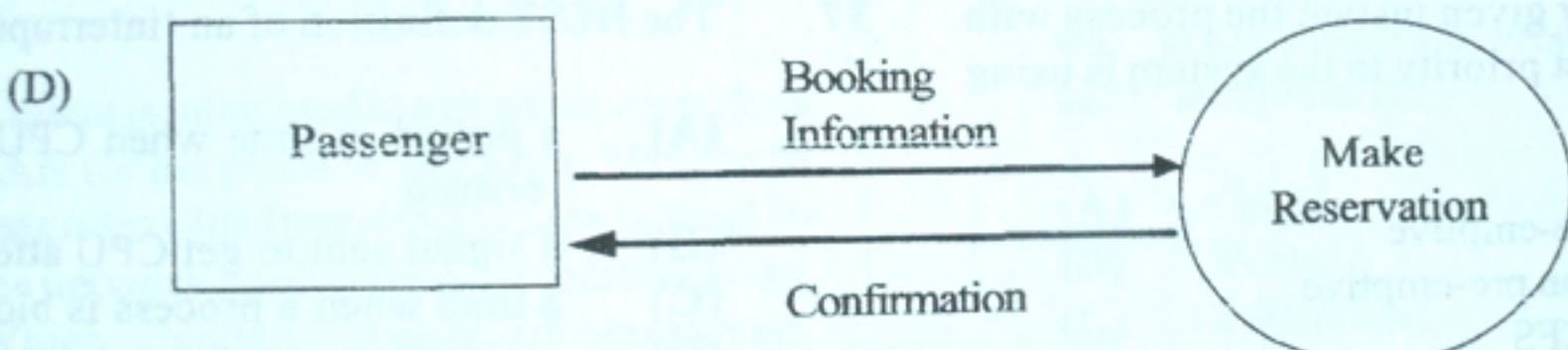
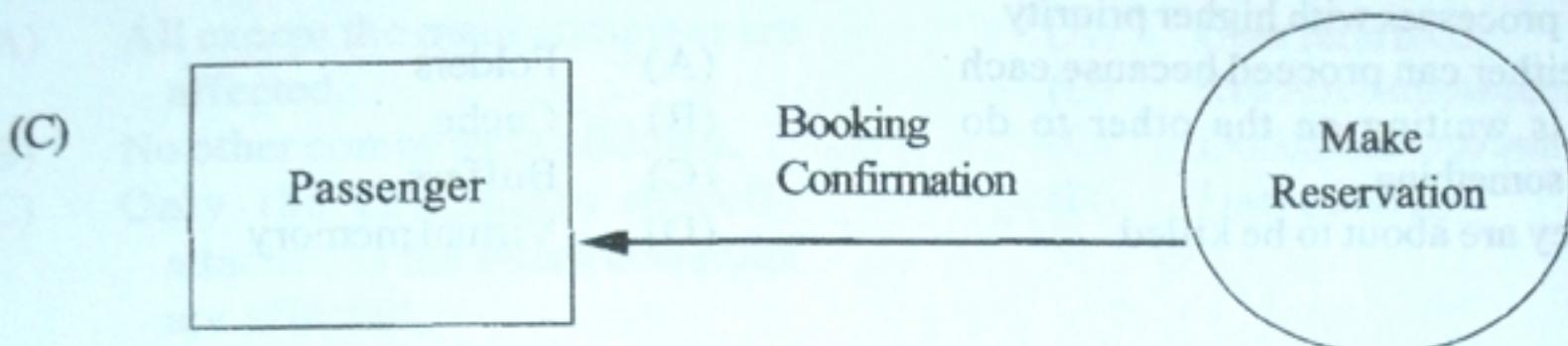
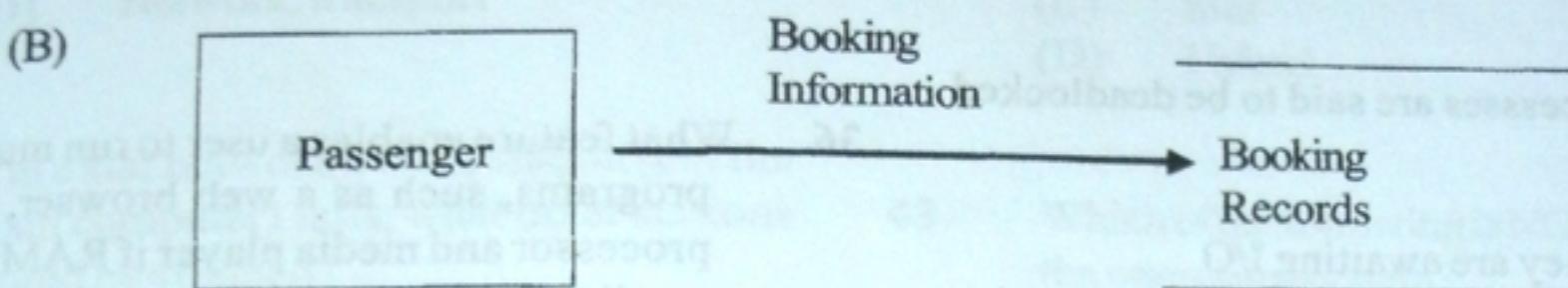
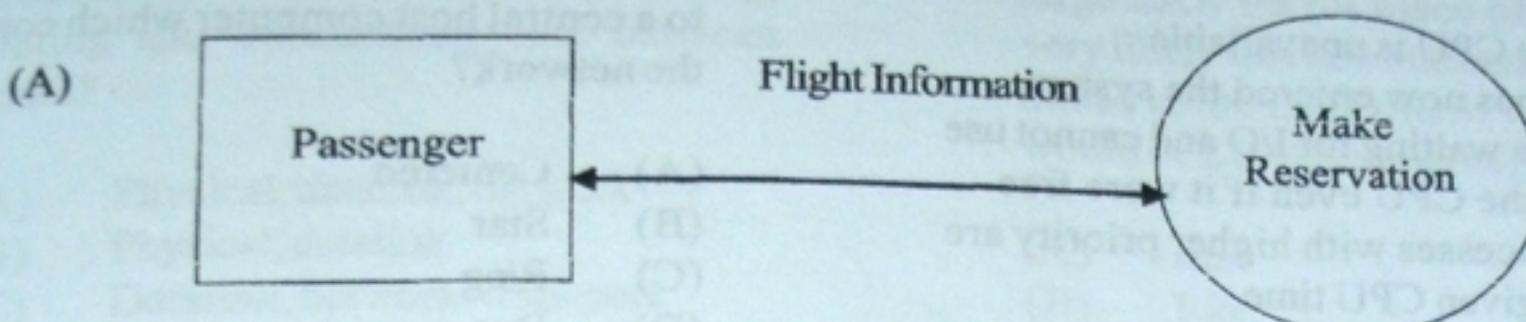
Entity: □



27. Which statement BEST describes the processing represented by the diagram?

- (A) *Create Invoice* uses information from data store *Customer Records* and sends an *Invoice* to *Customer*, and updates *Product Records*
- (B) A *Customer* requests an *Invoice* that is created by *Create Invoice* which in turn updates *Customer Records* and *Product Records*
- (C) *Create Invoice* uses information from *Customer Records* and *Product Records* to produce and send an *Invoice* to *Customer*
- (D) *Create Invoice* updates *Customer Records* and *Product Records* and sends an *Invoice* to *Customer*

28. Which of the following diagrams DOES NOT violate any rules for constructing data flow diagrams?



Items 29-30 refer to the following scenario.

The owner of a flower shop uses a relational database to store data on the orders made by customers and the types of flowers in stock.

29. How many entities can be identified?

- (A) One
- (B) Two
- (C) Three
- (D) Four

30. What type of relationship exists between customers and orders?

- (A) One to many
- (B) Many to one
- (C) One to one
- (D) Many to many

31. A process is said to be blocked when
- the CPU is unavailable
 - it has now entered the system
 - it is waiting for I/O and cannot use the CPU even if it were free
 - processes with higher priority are given CPU time
32. Two processes are said to be deadlocked when
- they are awaiting I/O
 - they are denied CPU time by processes with higher priority
 - neither can proceed because each is waiting on the other to do something
 - they are about to be killed
33. What type of scheduling algorithm ensures that at any given instant the process with the highest priority in the system is using the CPU?
- Pre-emptive
 - Non pre-emptive
 - FCFS
 - Non pre-emptive SJF
34. What term refers to a state when a large proportion of CPU time is spent swapping data between RAM and auxiliary storage?
- Thrashing
 - Partitioning
 - Fragmenting
 - Virtual memory
35. What is the name given to the network topology in which EACH node is connected to a central host computer which controls the network?
- Centered
 - Star
 - Ring
 - Bus
36. What feature enables a user to run multiple programs, such as a web browser, word processor and media player if RAM is too small to hold them all?
- Folders
 - Cache
 - Buffers
 - Virtual memory
37. The BEST definition of an ‘interrupt’ is
- a period in time when CPU does nothing
 - a signal sent to get CPU attention
 - a time when a process is blocked
 - a signal sent when a process is complete
38. Suppose a user wants to send a large file over a LAN. What measure can the user employ to transmit the file efficiently over the network?
- Encryption
 - Modem
 - Data compression
 - Password

39. Which of the following list of layers are collectively responsible for addressing, routing and transmitting data between nodes?
- (A) Physical, datalink, network
 - (B) Physical, datalink
 - (C) Datalink, network, transport
 - (D) Network, transport
40. If in a star network a work station (not the main computer) fails, what other stations would be affected?
- (A) All except the main computer are affected.
 - (B) No other computer is affected.
 - (C) Only the computers directly attached to the failed computer are affected.
 - (D) Only the main computer is affected.
41. A client is interested in setting up a wireless LAN for his place of business. Very high data rates (30Mbps-40Mbs) are critical to the network applications of this business. Which standard should be employed, 802.11a or 802.11b?
- (A) 802.11a since it can support the desired data rates.
 - (B) 802.11b since it can support the desired data rates.
 - (C) 802.11a or 802.11b will give similar performance, these standards do not differ in data rates.
 - (D) Neither will support such a high data rate.
42. A client is interested in setting up a very large LAN for his place of business. It is very likely that new stations will have to be added to the LAN often. Which topology would be LEAST suitable?
- (A) Bus
 - (B) Ring
 - (C) Star
 - (D) Hybrid
43. Which of the following is NOT a function of the operating system?
- (A) User interface
 - (B) Resource management
 - (C) Document creation
 - (D) User security
44. A hotel wants to offer its guests the facility of connecting to the Internet via a television set. What modem device is required to carry out this task?
- (A) Cable
 - (B) Voice
 - (C) Telephone
 - (D) Fax
45. Which of the following statements BEST describes a distributed network configuration?
- (A) All data and processing power are located at one node.
 - (B) Data and processing power can be scattered across many nodes.
 - (C) There are several printers on a network.
 - (D) Many users are on the network simultaneously.