

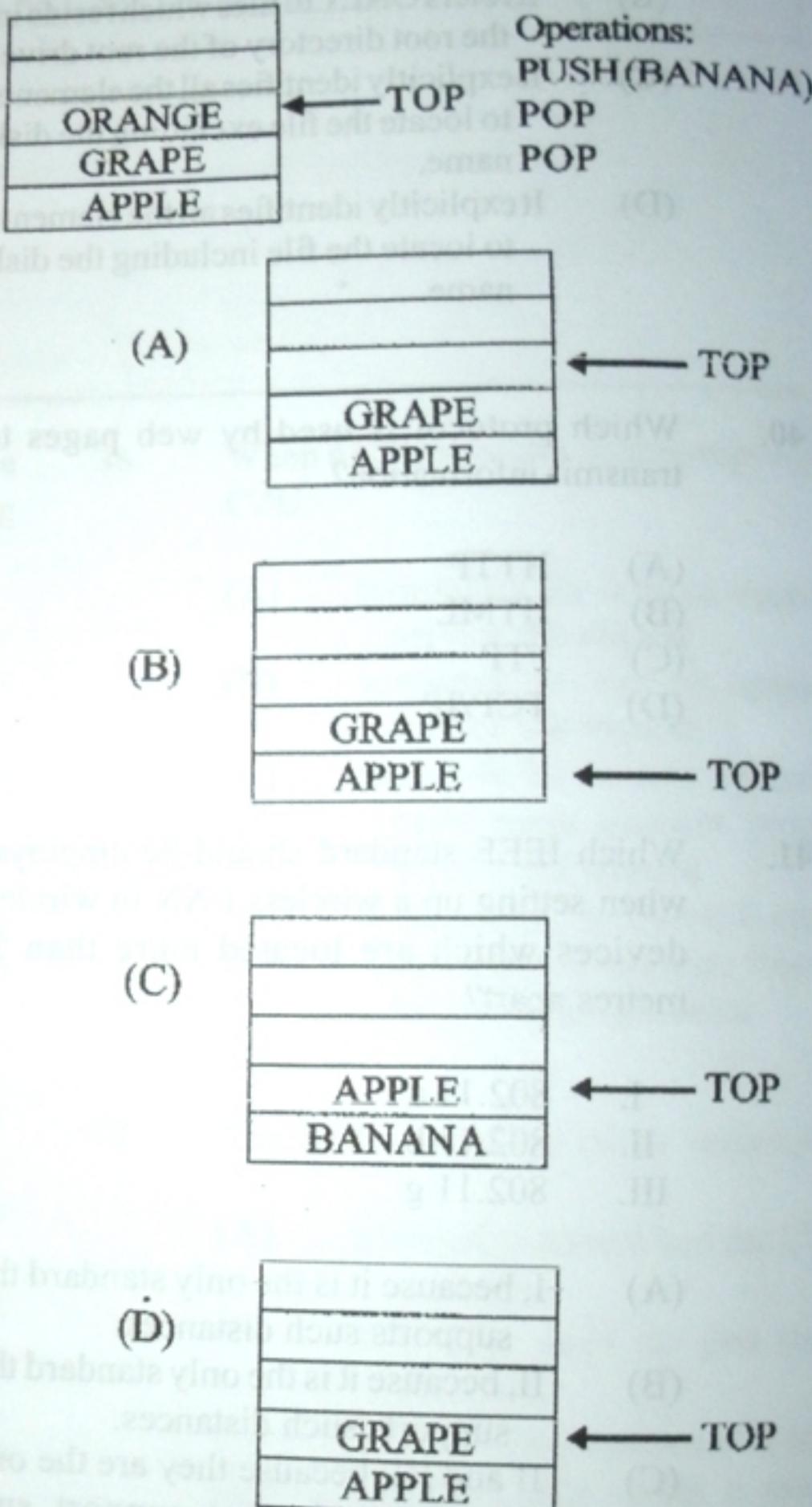
**COMPUTER SCIENCE
FOR CAPE
UNIT 2
PAPER 1 PAST PAPERS**

BATCH #4

COMPILED BY: ALEX STEWART

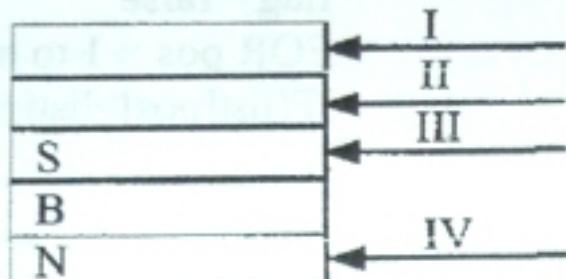
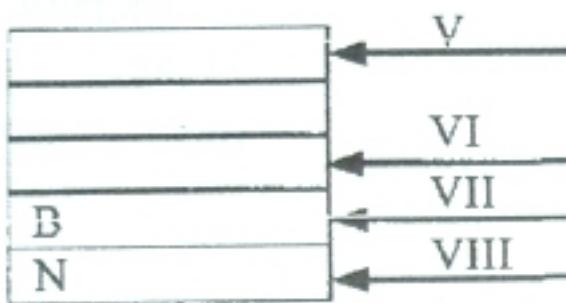
1. A stack is a data structure in which elements
- can be added to any position and removed only from the top
 - can be added only to the top and removed from any position
 - can be added and removed from the top only
 - can be added and removed from any position
2. The queue ADT operation ENQUEUE(X)
- adds the element X to the front of a queue
 - adds the element X to the rear of a queue
 - adds the element X to any free position in the queue
 - removes the element X from a queue
3. If the elements P, T, S, R and Q are added to a queue in that order and then removed one at a time, in what order will they be removed?
- P,Q,R,S,T
 - Q,R,S,T,P
 - P,T,S,R,Q
 - Q,P,R,T,S

4. 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?



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5. **Figure 1** below shows the state of a stack before the POP operation is performed. **Figure 2** shows the state after the POP operation is performed. Which of the following combinations of arrows correctly identifies the top of the stack structures?

Figure 1**Figure 2**

- (A) I and V
- (B) II and VI
- (C) III and VII
- (D) IV and VIII

6. The diagram below shows two items stored in a queue. Which sequence of operations would transform the queue from the initial state to the final state shown below?

Initial State

FRONT REAR



Final State

FRONT REAR



- (A) DEQUEUE, ENQUEUE(K), ENQUEUE(L)
- (B) ENQUEUE(L), ENQUEUE(K), DEQUEUE
- (C) DEQUEUE, DEQUEUE, ENQUEUE(L), ENQUEUE(K), ENQUEUE(J)
- (D) None of the above

7.

- The target value is 19. A binary search is employed. What is the second value to be compared with the target value, 19?

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

- (A) 14
- (B) 17
- (C) 20
- (D) 22

8.

- The target value is I. A binary search is employed. How many comparisons are made before we can conclude that letter I does not appear in the list?

A	C	E	F	G	K	L
---	---	---	---	---	---	---

- (A) 2
- (B) 3
- (C) 4
- (D) 7

9.

- A queue is implemented using an array. A procedure to add an element to the queue would involve

- (A) incrementing the pointer to the front of the queue
- (B) incrementing the pointer to the rear of the queue
- (C) decrementing the pointer to the front of the queue
- (D) decrementing the pointer to the rear of the queue

Item 10 refers to a segment of an algorithm for performing a linear search for *target* on an array *list* with size *n*.

```

count = 0
flag = false
REPEAT
    IF (list[count] = target) THEN
        I
    END IF
    II
UNTIL flag=true or III
IF flag = false THEN
    IV
END IF

```

10. Which sequence of the following steps would complete the procedure?

- (A) I – flag = true
II – add 1 to count
III – count = *n* – 1
IV – WRITE target not found
- (B) I – flag = true
II – add 1 to count
III – count = *n*
IV – WRITE target found
- (C) I – flag = true
II – add 1 to count
III – count = *n* – 1
IV – WRITE target found
- (D) I – flag = true
II – add 1 to count
III – count = *n*
IV – WRITE target found

Item 11 refers to a segment of an incomplete algorithm for sorting an array *list* of size *n* using a bubble sort.

```

REPEAT
    flag = false
    FOR pos = 1 to n – 1 DO
        IF (list[pos] > list[pos+1]) THEN
            I
            II
            III
            IV
        END IF
    END FOR
    subtract 1 from n
UNTIL flag = false or n = 1

```

11. Which of the following sequences would complete the algorithm?

- (A) I – flag = true
II – list[pos] = list[pos+1]
III – temp = list[pos]
IV – list[pos+1] = temp
- (B) I – temp = list[pos]
II – list[pos] = list[pos+1]
III – list[pos+1] = temp
IV – flag = true
- (C) I – flag = true
II – temp = list[pos]
III – list[pos+1] = temp
IV – list[pos] = list[pos+1]
- (D) I – temp = list[pos]
II – list[pos+1] = temp
III – list[pos] = list[pos+1]
IV – flag = true

Items 12 - 13 refer to the following scenario.

A student is asked to implement a stack using arrays. The student devises 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) II, I, III
(B) II, III, VII
(C) VII, IV, II
(D) VIII, III, I

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

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

14. Which of the following is a specification of a set of data and the set of operations that can be performed on the data?

- (A) Library
(B) ADT
(C) Package
(D) Tracer

15.

Consider a circular queue, Q, with a pointer **rear** that references the location of the rear of the queue. 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, Q?

enqueue, enqueue, enqueue, dequeue,
dequeue, enqueue, enqueue, enqueue,
dequeue

- (A) 0
(B) 1
(C) 2
(D) 3

16.

Which software process model is based on integration of existing components into a system rather than starting from scratch?

- (A) Waterfall approach
(B) Evolutionary development
(C) Fountain approach
(D) Reuse-oriented approach

17.

What is a data dictionary?

- (A) A reference document for use by end users
(B) List of types of data the system processes
(C) List of names included in different models of a system with associated descriptions
(D) List of names used throughout the code with associated descriptions

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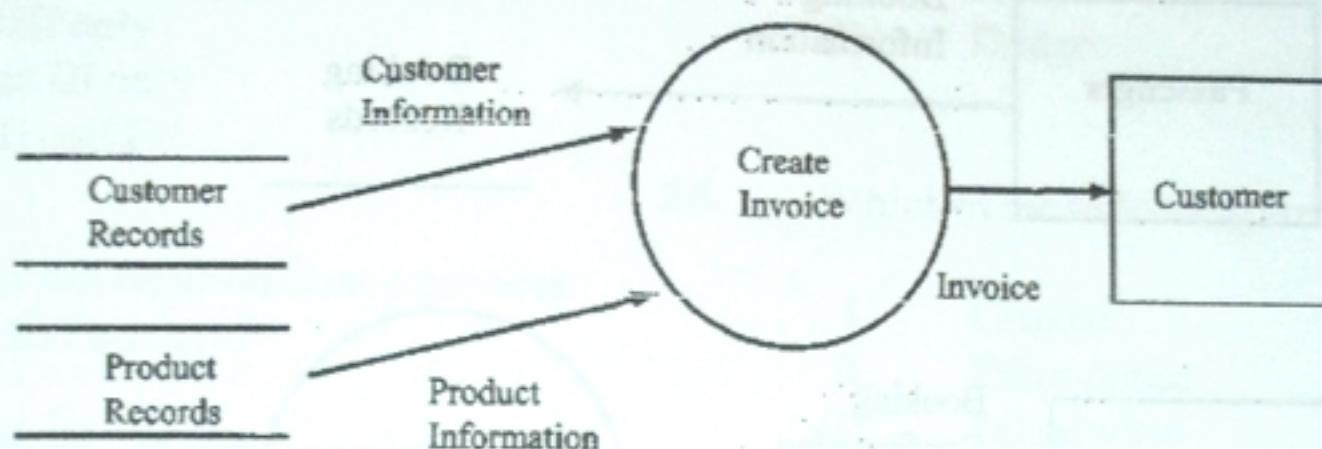
18. A company with many employees and branches located in various Caribbean territories is interested in replacing their existing software system with a new system. What approach is MOST appropriate for gathering information during the analysis phase?
- (A) Interviews with key people at a few branches
 - (B) Through the distribution of questionnaires
 - (C) Observation of practices at a few branches
 - (D) Prototyping
19. What attribute does NOT contribute to a system's maintainability?
- (A) Useful documentation
 - (B) Consistent, meaningful variable names
 - (C) Pieces of code with well-defined purpose
 - (D) Code that provides functionality not currently used, but will be possibly used in the future
20. Which of the following statements is NOT true of evolutionary development?
- (A) The process is not visible.
 - (B) Prototyping may lead to a lengthy development process.
 - (C) Systems are often poorly structured.
 - (D) The approach is not suitable for larger systems.
21. Which of the following is NOT a recognized technique for determining software requirements?
- (A) Research through the Internet
 - (B) Interviews with end users
 - (C) Questionnaires
 - (D) Observation
22. Constructs of an entity-relationship diagram are
- (A) entity, relationship
 - (B) entity, relationship, flow
 - (C) entity, attribute, relationship
 - (D) entity, attribute, relationship, flow
23. Which of the following statements is true of data flow diagrams?
- (A) Data cannot be moved directly from one store to another.
 - (B) A data flow may flow in both directions between two symbols.
 - (C) A process can have only output.
 - (D) A data flow to a store means retrieve or use.
24. Which of the following is LEAST helpful in an error message presented to a user?
- (A) System-specific terms
 - (B) User-oriented language
 - (C) Many options for recovery
 - (D) Description of the error
25. Which of the following describe the contents of an entry in a data dictionary?
- I. The name of the element
 - II. The type and format of the element
 - III. A list of related elements
 - IV. A textual description of the element
- (A) I and II only
 - (B) I, II and III only
 - (C) I, II and IV only
 - (D) I, II, III and IV

Items 26 - 27 utilize the following symbols.

Process: 
Entity: 

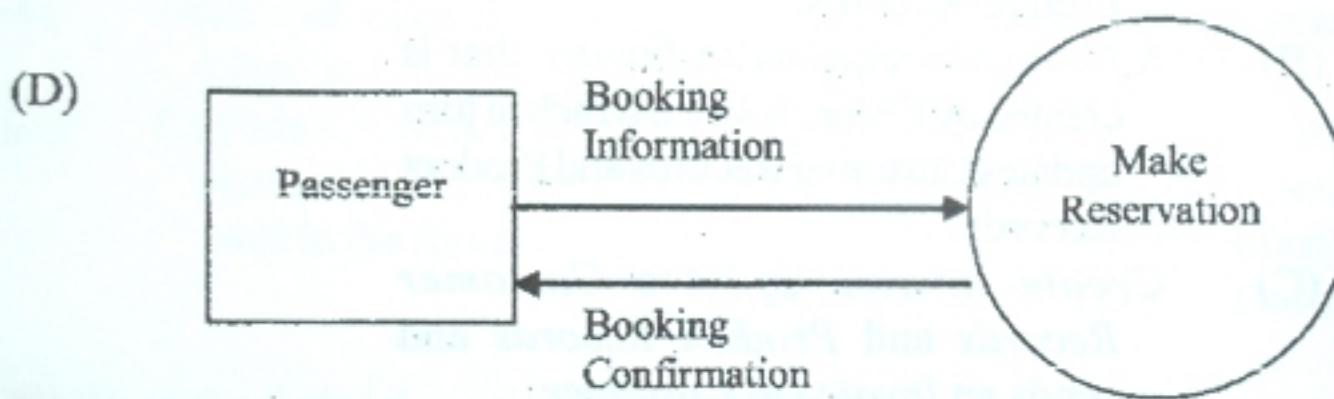
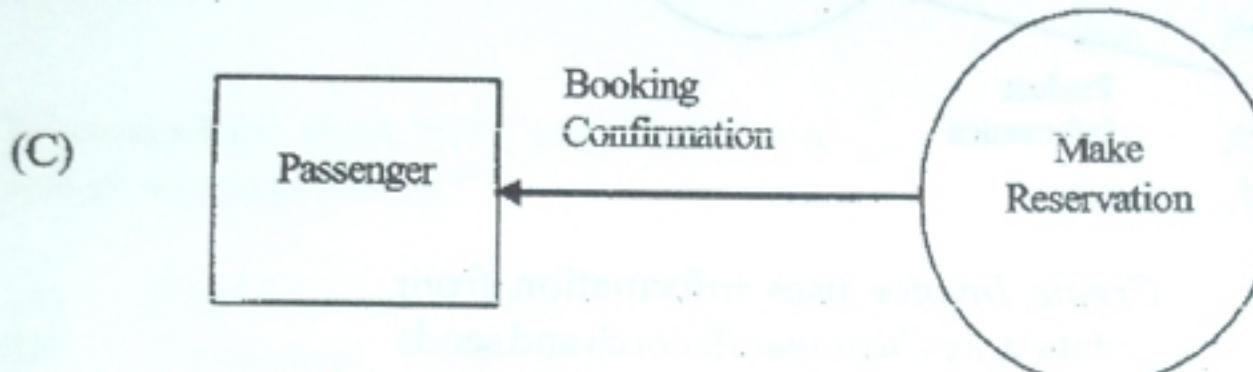
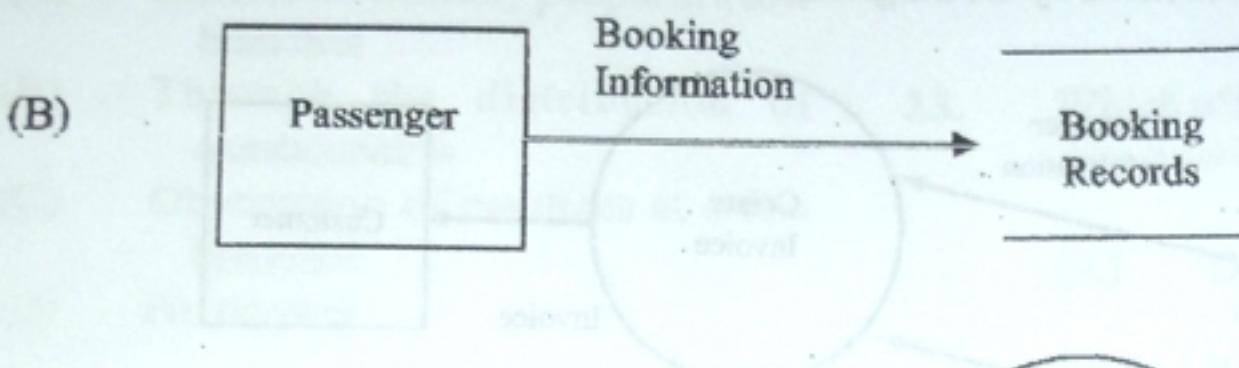
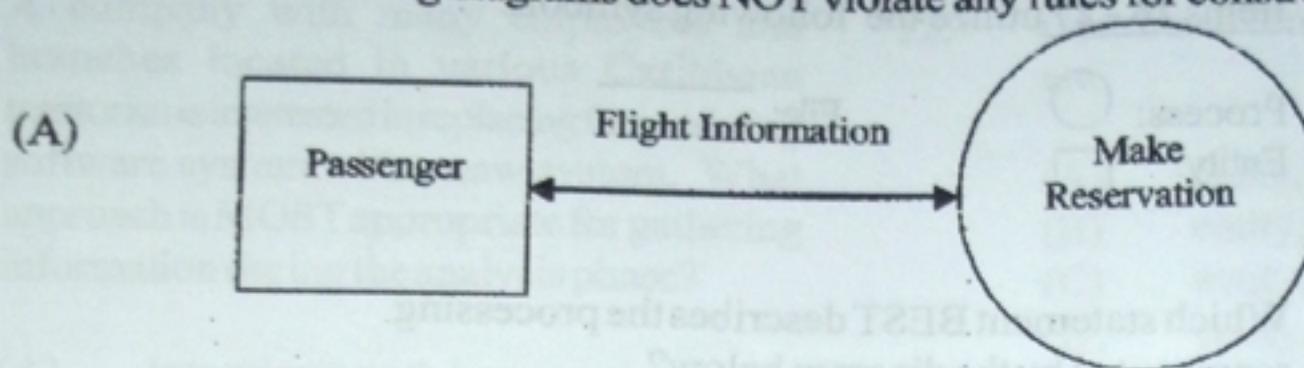
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26. Which statement BEST describes the processing represented by the diagram below?



- (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* updates *Customer Records* and *Product Records* and sends an *Invoice* to *Customer*.
- (D) *Create Invoice* uses information from *Customer Records* and *Product Records* to produce and send an *Invoice* to *Customer*.

27. Which of the following diagrams does NOT violate any rules for constructing data flow diagrams?



28. In database modelling, an 'attribute' is

- (A) an object of interest to an organisation about which data is stored
- (B) a property or characteristic of an entity
- (C) a link or association between entities
- (D) a property or characteristic of the organisation

29. You are required to design an interface for a video game so that it is fast, intuitive and easy to learn. The BEST interaction style to use is

- (A) menu selection
- (B) form fill-in
- (C) natural language
- (D) direct manipulation

30. Which of the following are examples of non-functional requirements?
- Platform constraints
 - Response times
 - Reliability
 - Fault tolerance
- (A) I and III only
 (B) II and III only
 (C) I, II and III only
 (D) I, II, III and IV
31. Which piece of information does a process control block NOT contain?
- (A) Amount of CPU time used
 (B) Estimated time to completion
 (C) Job priority
 (D) Process ID
32. Which of the following is used only to protect a single file from unauthorized access?
- (A) Encryption
 (B) Username
 (C) Password
 (D) Lockword
33. What is 'firewire'?
- (A) A type of cabling that allows communication between computers
 (B) Software running on a computer that protects it from external attacks
 (C) A high-speed serial bus system
 (D) A virus
34. Which of the following statements is NOT true about files and folders?
- (A) Folders may contain zero or more files.
 (B) Files within folders must be related.
 (C) File names within a folder must be unique.
 (D) Folders can be used to organize files.
35. Consider a network where the users run applications that generate a significant amount of network traffic. Which of the following devices would NOT be suitable for providing communication between the computers?
- (A) Hub
 (B) Switch
 (C) Router
 (D) Bridge
36. Which of the following are wired media?
- Coaxial
 - Fiber-optics
 - Microwave
 - Twisted pair
- (A) I and IV only
 (B) III and IV only
 (C) I, II and IV only
 (D) I, II, III and IV
37. What are the layers of the OSI model in order from the LOWEST to the HIGHEST?
- (A) Physical, datalink, network, transport, presentation, session, application
 (B) Physical, datalink, transport, network, presentation, session, application
 (C) Physical, datalink, session, network, presentation, transport, application
 (D) Physical, datalink, network, transport, session, presentation, application
38. If a node fails in a ring network, what other stations are affected?
- (A) All other stations
 (B) No other computer
 (C) Only the computers directly attached to the failed computer
 (D) Only the main computer

39. A client is interested in setting up a computer network for his place of business. Below are listed some properties that are important to the client. Which property below BEST indicates when a wireless network may be more suitable than a wired one?

- (A) Reliable
- (B) Inexpensive
- (C) Enhanced mobility
- (D) High bandwidth

40. A client is interested in setting up a wireless LAN for a very large warehouse while minimizing cost. Which of the following standards should be employed?

- (A) 802.11a to support longer distances, so fewer access points needed
- (B) 802.11b to support longer distances, so fewer access points needed
- (C) 802.11a or 802.11b to give similar performance, since these standards do not differ in transmission distances
- (D) Neither 802.11a or 802.11b since they do NOT support transmission over a large distance

41. Which of the following is true about a process being scheduled with a non-preemptive algorithm?

- (A) It is placed at the top of the ready queue if it has a higher priority than all the processes already in the queue.
- (B) Once it enters the running state, it is allowed to run to completion or until it yields the processor.
- (C) Once it enters the running state, it is given a fixed amount of time to use the CPU after which other processes get a chance to use the CPU.
- (D) Once it enters the running state, it is given a variable amount of time to use the CPU depending on its priority.

42. A client has security concerns with respect to his network which contains computers which frequently access the Internet. Which of the following should be implemented?

- (A) Firewall
- (B) Firewire
- (C) Activity logs
- (D) Passwords

43. Which of the following is NOT a function of an operating system?

- (A) User interface
- (B) Resource management
- (C) Document creation
- (D) User security

44. Which of the following determines the amount of time a running process gets to use the CPU when a round-robin scheduling algorithm is used?

- (A) The order of arrival of the process on the ready queue.
- (B) The priority of the process.
- (C) The estimated running time of the process.
- (D) The time is fixed by the operating system.

45. A running process initiates an input request to get data from the keyboard. Which of the following state transitions will take place when the data is made available?

- (A) Ready to running
- (B) Running to ready
- (C) Blocked to ready
- (D) Blocked to running