

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

BATCH #3

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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. 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?

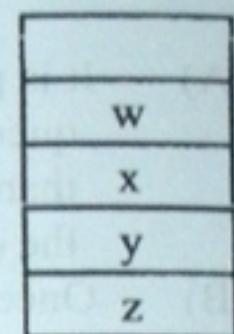
- (A) P,Q,R,S,T
- (B) Q,R,S,T,P
- (C) P,T,S,R,Q
- (D) Q,P,R,T,S

4. The Mount Hololo High School has one computer lab with 10 computers and one printer fully networked. What ADT would be BEST suited to handle the print jobs of the students?

- (A) Array
- (B) Stack
- (C) Queue
- (D) Linked list

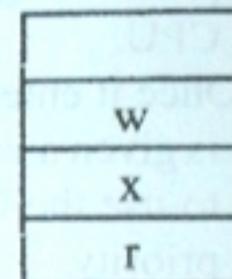
5.

A stack contains the elements w, x, y and z as shown below.

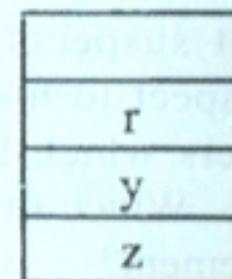


Which of the following would be the contents of the stack after 2 elements were removed, and element r was inserted?

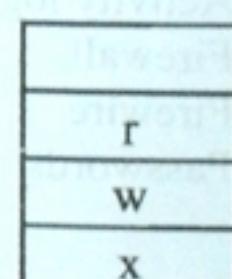
(A)



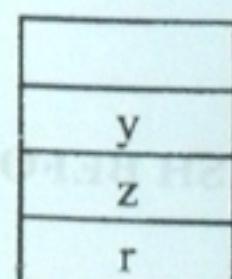
(B)



(C)



(D)



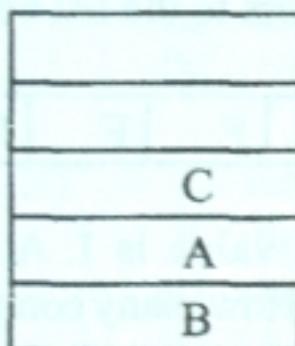
6. Consider a circular queue, Q, with a pointer **rear** that references the location of the rear of the queue. Assuming that the locations range from 0 to 4, what is the value of the pointer **front**, after performing the following operations on the queue, Q?

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

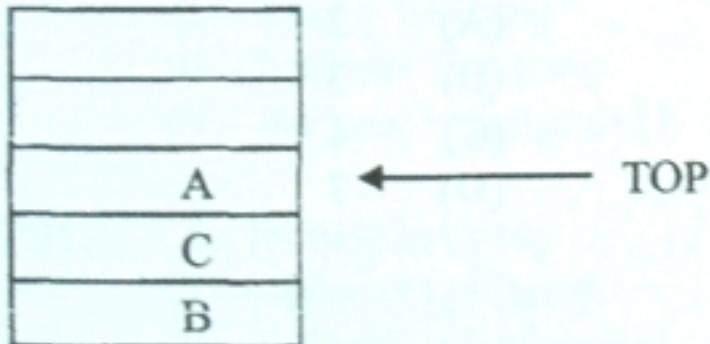
- (A) 0
- (B) 1
- (C) 2
- (D) 3

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?

POSITION	0	1	2	3	4	5
	30	32	24	18	7	3
(A) POSITION	0	1	2	3	4	5
(B) POSITION	0	1	2	3	4	5
(C) POSITION	0	1	2	3	4	5
(D) 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

Items 10 - 11 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.

10. 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

11. 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

Items 12 – 13 refer to the diagram below.



12. What is the Abstract Data type depicted above?

- (A) Stack
- (B) Queue
- (C) Enum
- (D) Linked list

13. Which of the following operations is associated with the ADT above?

- (A) Insert
- (B) Enqueue
- (C) Dequeue
- (D) Pop

Item 14 refers to the list below.

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

14. 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) 2
- (B) 3
- (C) 4
- (D) 7

Item 15 refers to a segment of an incomplete algorithm for sorting an array list of size n using a bubble sort.

REPEAT

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    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

```

15. 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

16. Software that is not associated with the wasting of resources is said to have the property of

- (A) efficiency
- (B) reliability
- (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 the proposed system

18. 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

19. Which of the following BEST represents the normal progression of tasks in the waterfall approach to software development?

- (A) Design, implementation, maintenance, requirements specification, verification
- (B) Requirements specification, design, implementation, verification, maintenance
- (C) Implementation, verification, requirements specification, maintenance
- (D) Verification, requirements specification, maintenance, implementation, design

20. 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) II and III only
- (C) I, II and IV only
- (D) I, II, III and IV

21. Which of the following graphical tools is BEST suited to showing how a software development project and its subtasks should be completed within a specified timeframe?

- (A) Gantt chart
- (B) Decision tree
- (C) Dataflow diagram
- (D) System flowchart

22. When the individual modules of a software system were tested, no errors were discovered. However, when all the modules were merged together and tested, the system failed.

Which of the following would MOST likely help in identifying the failure?

- (A) Acceptance testing
- (B) Integration testing
- (C) Testing individual modules
- (D) Testing using live data

23. Which of the following are examples of non-functional requirements?

- I. Platform constraints
 - II. Response times
 - III. Reliability
 - IV. Fault tolerance
- (A) I and III only
 - (B) II and III only
 - (C) I, II and III only
 - (D) I, II, III and IV

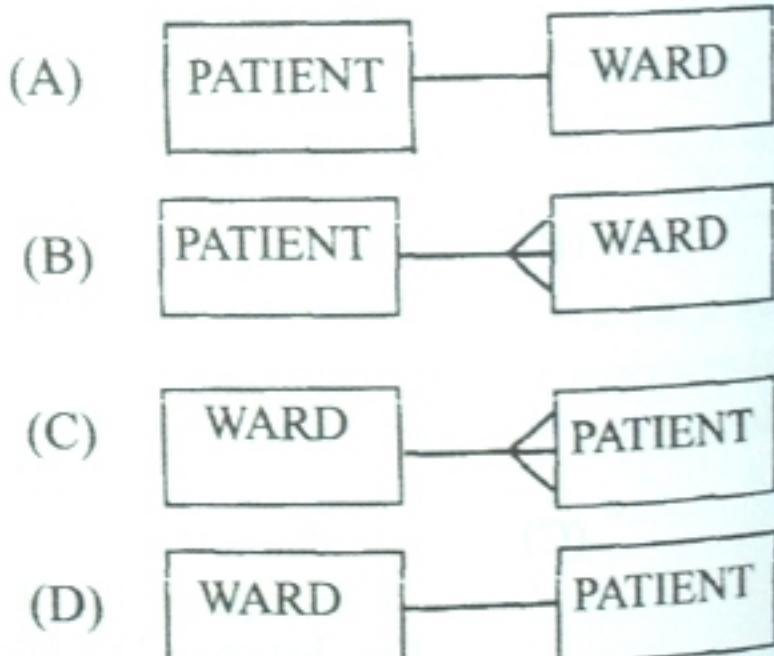
24.

A small company with fewer than ten employees is interested in replacing their existing paper-based system with a software application. Which of the following is MOST appropriate for gathering information during analysis?

- (A) Distributing questionnaires to employees and clients of the company
- (B) Researching company practices on the Internet
- (C) Interviewing priority clients of the company
- (D) Interviewing key people at the company

25.

A hospital keeps data on patients, wards and staff. Which of the ER diagrams below BEST shows the relationship between patients and wards?



26.

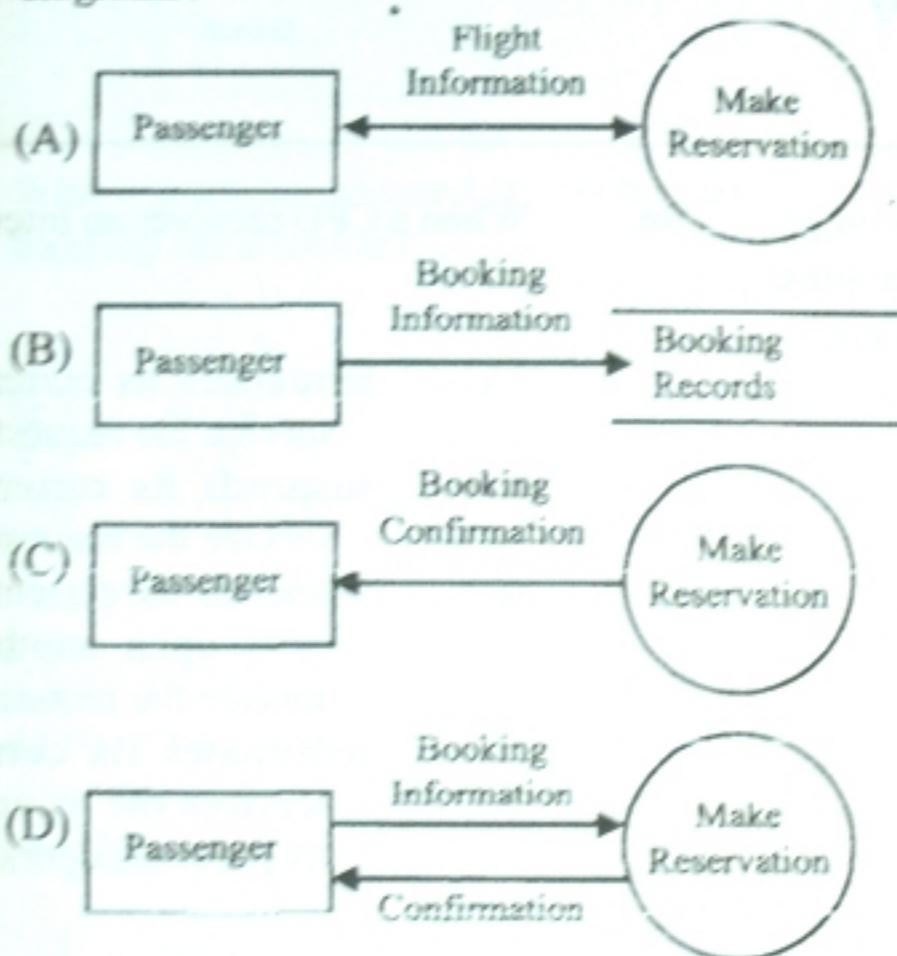
What attribute does NOT contribute to a system's maintainability?

- (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

27. Which of the following might be output as a result of using a CASE tool?

- (A) Prototype
- (B) Cost/benefit analysis
- (C) Program definition
- (D) Feasibility study

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

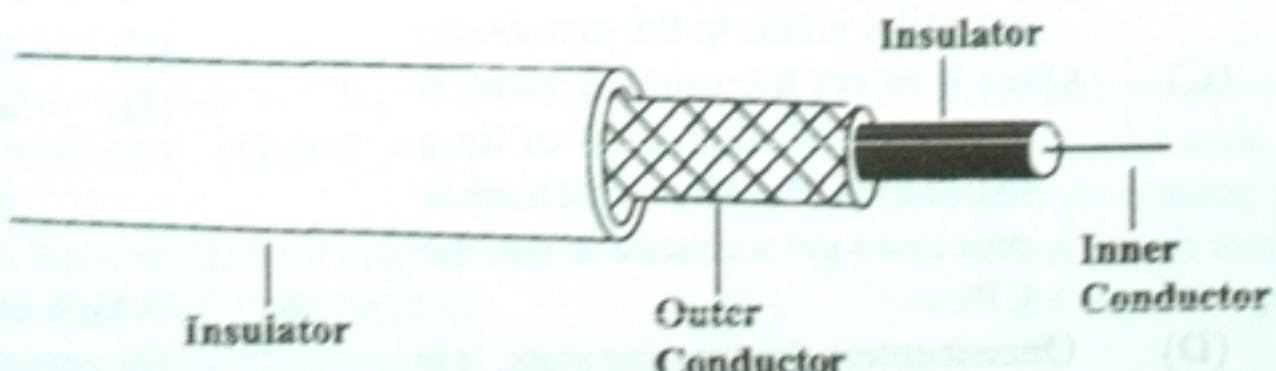
30. What type of relationship exists between the customer and the orders?

- (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

- (A) the CPU is unavailable
- (B) it has now entered the system
- (C) it is waiting for I/O and cannot use the CPU even if it were free
- (D) processes with higher priority are given CPU time

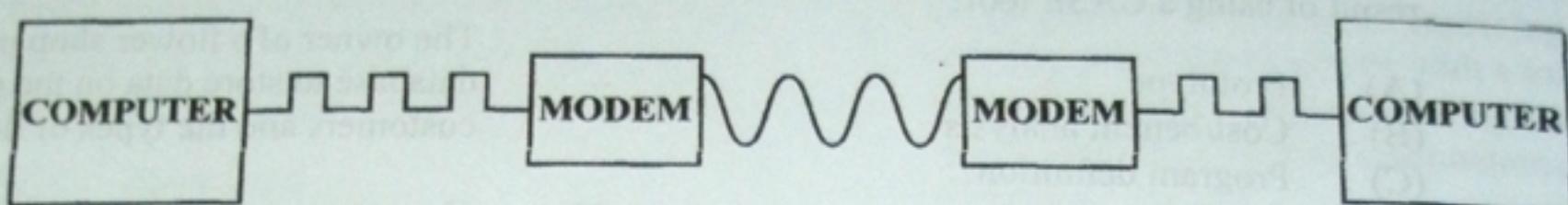
Item 32 refers to the cable shown in the diagram below.



32. What type of cable is shown in the diagram?

- (A) Coaxial
- (B) Fibre optic
- (C) Firewire
- (D) Shielded twisted pair

Item 33 refers to the diagram shown below.



33. The diagram BEST illustrates

- (A) addressing
- (B) modulation and demodulation
- (C) multiplexing and expandability
- (D) routing

34. What term refers to a state when a large proportion of CPU time is spent swapping data between RAM and auxiliary storage?

- (A) Thrashing
- (B) Partitioning
- (C) Fragmenting
- (D) Virtual memory

35. 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 to 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.

36. When a CPU receives an interrupt signal, the CPU

- (A) terminates its current operation to service the request
- (B) suspends its current operation to service the request
- (C) suspends its current operation and calls upon another program to service the request
- (D) terminates its current operation, services the request, then restarts its previous operation

37. The BEST definition of an 'interrupt' is

- (A) a period in time when the CPU does nothing
- (B) a signal sent to get the CPU attention
- (C) a time when a process is blocked
- (D) a signal sent when a process is complete

38. Which of the following is the BEST reason for compressing a file?

- (A) To encrypt the file to protect its contents
- (B) To make the file compatible with other applications and hardware
- (C) To increase transmission time over a network
- (D) To occupy less space on storage media

39. Which of the following BEST describes an absolute file path?
- It includes a reference to a storage device.
 - It refers ONLY to files which reside in the root directory of the root drive.
 - It explicitly identifies all the elements to locate the file excluding the disk name.
 - It explicitly identifies all the elements to locate the file including the disk name.
40. Which protocol is used by web pages to transmit information?
- HTTP
 - HTML
 - FTP
 - TCP/IP
41. Which IEEE standard should be employed when setting up a wireless LAN in wireless devices which are located more than 50 metres apart?
- 802.11 a
 - 802.11 b
 - 802.11 g
- I, because it is the only standard that supports such distances.
 - II, because it is the only standard that supports such distances.
 - II and III, because they are the only 2 standards that support such distances.
 - I, II and III, because they all support such distances but they support different rates of data transmission.
42. A webmaster has decided to design his website offline and upload the various files and graphics to the web-server remotely. Which of the following would be BEST suited to providing the fastest and MOST secure method of uploading the data?
- FTP
 - GSM
 - HTML
 - UML
43. Which of the following is NOT a function of the operating system?
- User interface
 - Resource management
 - Document creation
 - User security
44. In a network where the running applications generate a significant amount of traffic, which of the following devices would NOT be suitable?
- Router
 - Switch
 - Hub
 - Bridge
45. Which of the following statements BEST describes a distributed network configuration?
- All data and processing power are located at one node.
 - Data and processing power can be scattered across many nodes.
 - There are several printers on a network.
 - Many users are on the network.