MCQs

Q.1 Descending priority queue can be implemented using _____

a. max heap

b. min heap

c. min-max heap

d. trie

Ans. max heap

Q.2 Which value is pointed out first in max heap?

a. First value

b. Lowest value

c. Highest value

d. None of the above

Ans. Highest Value

Q.3 The worst case complexity of deleting any arbitrary node value element from heap is _____

a. O(logn)

b. O(n)

c. O(logn)

d. O(n^2)

Ans. O(logn)

Q.4 What is the complexity in adding a new element to the heap?

a. O(h)

b. O(log n) & O(h)

c. O(n)   d. O(log n)

Ans. O(log n)

Q.5 In a binary max heap containing n numbers, the smallest element can be found in time

a. O(n)   b. O(n^2)

c. O(nlogn)   d. O(log n)

Ans. O(n)

Q.6 What is the best case complexity in building a heap?

a. O(n)   b. O(n^2)

c. O(nlogn)   d. O(logn)

Ans. O(n)

Q.7 The procedure FindMin() to find the minimum element and the procedure DeleteMin() to delete the minimum element in min heap take _____

a. logarithmic and linear time constant respectively   b. constant and linear time respectively

c. constant and quadratic time respectivel   d. constant and logarithmic time respectivel

Ans. constant and logarithmic time respectivel

Q.8 Suppose we are sorting an array of eight integers using heapsort, and we have just finished some heapify (either maxheapify or minheapify) operations. The array now looks like this:

16 14 15 10 12 27 28

How many heapify operations have been performed on root of heap?

a. 1

b. 2

c. 5 or 6

d. 3 or 4

Ans. 2

Q.9 An array consists of n elements. We want to create a heap using the elements. The time complexity of building a heap will be in order of

a. O(n*n*logn)

b. O(n*logn)

c. O(n*n)

d. O(n *logn *logn)

Ans. O(n*logn)

Q.10 Which one of the following array elements represents a binary min heap?

a. 10 12 8 25 14 17

b. 25 17 14 12 10 8

c. 8 10 12 25 14 17

d. 14 17 25 10 12 8

Ans. 8 10 12 25 14 17

Q.11 Given an array of element 5, 7, 9, 1, 3, 10, 4, 8. Which of the following is the correct sequences of elements after inserting all the elements in a min-heap?

a. 1,3,4,5,7,8,9,10

b. 1,4,5,8,3,6,9,10

c. 10,9,8,7,5,3,1

d. 1,3,4,5,8,7,9,10

Ans. 1,3,4,5,7,8,9,10

Q.12 The max heap constructed from the array of numbers A[]={30, 10, 80, 60, 15, 55} is

a. 60 80 30 55 10 30

b. 80 60 55 30 10 15

c. 60 80 55 30 10 15

d. 80 55 60 15 10 30

Ans. 80 55 60 15 10 30

Q.13 If there are n children of the root, how many calls to the merge procedure is required to reassemble the heap?

a. n+1

b. n-1

c. n

d. 1

Ans. n-1

Q.14 What will be the position of 5, when a max heap is constructed on the input elements 5, 70, 45, 7, 12, 15, 13, 65, 30, 25?

a. 5 will be at last level

b. 5 will be at third level

c. 5 will be at root

d. 5 will be at second level

Ans. 5 will be at last level

Q.15 Given two max heaps of size n each, what is the minimum possible time complexity to make a one max-heap of size from elements of two max heaps?

a. O(nlogn)

b. O(n^2)

c. O(logn)

d. O(n)

Ans. O(n)

Q.16 A queue is implemented using an array such that ENQUEUE and DEQUEUE operations are performed efficiently. Which one of the following statements is CORRECT

a. Both operations can be performed in O (1) time

b. At most one operation can be performed in O (1) time but the worst case time for the other operation will Ω(n)

c. The worst case time complexity for both operations will be Ω(n)

d. The worst case time complexity for both operations will be Ω(logn)

Ans. Both operations can be performed in O (1) time

Relevel

Q.17 In a circular queue, how do you increment the rear end of the queue?

a. (rear+1) % CAPACITY

b. (rear % CAPACITY)+1

c. rear++

d. rear--

Ans. (rear+1) % CAPACITY

Q.18 What is not a disadvantage of priority scheduling in operating systems?

a. A low priority process might have to wait indefinitely for the CPU

b. If the system crashes, the low priority systems may be lost permanently

c. Interrupt handling

d. Indefinite blocking

Ans. Interrupt handling

Q.19 Following sequence of operations is performed on a stack push(1),push(2),pop, push(1),push(2)pop,pop,pop,push(2),pop.The sequence of poped out values are

a. 2,2,1,1,2

b. 2,2,1,2,2

c. 2,1,2,2,1

d. 2,1,2,2,2

Ans. 2,2,1,1,2

Q.20 In the stack, If user try to remove an empty stack then 'this condition is known as

a. Underflow of stack

b. Overflow of stack

c. Empty stack

d. Garbage collection

Ans. Underflow of stack

Q.21 What is the postfix form of the following prefix expression -A/B*C$DE

a. ABCDE$*/-

b. A-BCDE$*/-

c. ABC$ED*/-

d. A-BCDE$*/

Ans. ABCDE$*/-

Q.22 Using Pop (S1,Item) ,Push(S1, Item), Getlist(Item), Pop(S2,Item), and the variables S1,S2(stacks with Top1 and Top2) and Item and given the input file: A,B,C,D,E,F Which stack are possible?

a. All possible stacks with A,B,C,D,E and F

b. No possible stacks with A,B,C,D,E and F

c. Exact and only those stacks which can be produced with S1 alone

d. Twice as many stacks as can be produced with S1 alone

Ans. All possible stacks with A,B,C,D,E and F

Q.23 Suppose a stack implementation supports an instruction REVERSE, which reverses the order of elements on the stack, in addition to the PUSH and POP instructions. Which one of the following statements is TRUE with respect to this modified stack?

a. A queue cannot be implemented using this stack.

b. A queue can be implemented where ENQUEUE takes a sequence of three instructions and DEQUEUE takes a single instruction.

c. A queue can be implemented where ENQUEUE takes a single instruction and DEQUEUE takes a sequence of two instructions.

d. A queue can be implemented where both ENQUEUE and DEQUEUE take a single instruction each

Ans. A queue can be implemented where ENQUEUE takes a sequence of three instructions and DEQUEUE takes a single instruction.

Q.24 The following postfix expression with single digit operands is evaluated using a stack: 8 2 3 ^ / 2 3 * + 5 1 * - Note that ^ is the exponentiation operator. The top two elements of the stack after the first * is evaluated are:

a. 6,1

b. 5,7

c. 3,2

d. 1,5

Ans. 6,1

Q.25 The five items:A,B,C,D, and E are pushed in a stack, one after the other starting from A.The stack is popped four times and each element is inserted in a queue.Then two elements are deleted from the queue and pushed back on the stack.Now one item is popped from the stack.

The popped item is

a. A

b. D

c. E

d. C

Ans. D

Q.26 If memory for the run-time stack is only 150 cells(words), how big can N be in Factorial(N) before encounterring stack overflow?

a. 26

b. 24

c. 12

d. 20

Ans. 26

Q.27 The postfix form of the expression (A+B)∗(C∗D-E)∗F/G is

a. AB+CD ∗ E−FG/∗∗

b. AB+CD ∗ E−F∗∗G/

c. AB+CD ∗ E−∗F∗G/

d. AB+CDE∗ −∗F∗G/

Ans. AB+CD ∗ E−F∗∗G/

Q.28 Consider the following sequence of operations on an empty stack.

push(54); push(52); pop(); push(55); push(62); s = pop();

Consider the following sequence of operations on an empty queue.

enqueue(21); enqueue(24); dequeue(); enqueue(28); enqueue(32); q = dequeue();

The value of s + q is _____

a. 56

b. 86

c. 130

d. 60

Ans. 86

Q.29 <pre>

Using

Pop(S1, Item)

Push(S1,Item)

Read(Item)

Print(Item)

</pre>

the variables S1 represents (stack) and Item are given the input file:

A,B,C,D,E,F <EOF>

Which stacks are possible:

a. 5   A

4   B

3   C

2   D

1   E

b. 5

4

3   F

2   D

1   B

c. 5

4

3   D

2   A

d. 5

4

3   C

2   E

| 1 | F | | 1 | B |

Ans. 5

4

3   F

2   D

1   B

Q.30 Stack A has the entries a,b,c(with a on top).

Stack B is empty.An entry popped out of stack A can be printed immediately or pushed to stack B.An entry popped out of the stack B can only be printed. In this arrangement, which of the following permutations of a,b,c are not possible?

a. b a c   b. b c a

c. c a b   d. c b a

Ans. c a b

Q.31 Consider the following pseudocode that uses a stack. What is output for input "letsfindc"?
declare a stack of characters

<pre>

while (there are more characters in the word to read)

{

read a character

push the character on the stack

}

while (the stack is not empty)

{

pop a character off the stack

write the character to the screen

}

</pre>

a. letsfindcletsfindc   b. cdnifstel

c. letsfindc   d. cdnifstelcdnifstel

Ans. cdnifstel

Q.32 Following is an incorrect pseudocode for the algorithm which is supposed to determine whether a sequence of parentheses is balanced: Which of these unbalanced sequences does the above code think is balanced?
declare a character stack

<pre>

while (more input is available)

{

read a character

if (the character is a '(')

push it on the stack

else if (the character is a ')' and the stack is not empty)

pop a character off the stack

else

print "unbalanced" and exit

}

print "balanced"

</pre>

a. ((())   b. ())(()

c. (()()))   d. (()))()

Ans. ((())

Q.33 A function f defined on stacks of integers satisfies the following properties. f($\varnothing$) = 0 and f (push (S, i)) = max (f(S), 0) + i for all stacks S and integers i. If a stack S contains the integers 2, -3, 2, -1, 2 in order from bottom to top, what is f(S)

a. 6

b. 3

c. 1

d. 2

Ans. 3

Q.34 Let the following circular queue can accommodate maximum six elements with the following data.What will happen after ADD O operation takes place? front = **2** rear = **4**

queue = _____; L, M, N, ____, ____

a. front = 2 rear = 5
queue = _____; L, M, N, O, ____

b. front = 3 rear = 5

queue = L, M, N, O, ____

c. front = 3 rear = 4

queue = _____; L, M, N, O, ____

d. front = 2 rear = 4

queue = L, M, N, O, ____

Ans. front = 2 rear = 5 queue = _____; L, M, N, O, ____

Q.35 What does the following piece of code do?public Object function()

<pre>

{

if(isEmpty())

return -999;

else

{

Object high;

high = q[front];

return high;

}

}

</pre>

a. Dequeue

b. Enqueue

c. Return the front element

d. None of the above

Ans. Return the front element

Q.36 If the MAX_SIZE is the size of the array used in the implementation of circular queue. How is rear manipulated while inserting an element in the queue?

a. rear=(rear%1)+MAX_SIZE

b. rear=rear%(MAX_SIZE+1)

c. rear=rear+(1%MAX_SIZE)

d. rear=(rear+1)%MAX_SIZE

Ans. rear=(rear+1)%MAX_SIZE

Q.37 If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?

a. DCBA

b. ABCD

c. DCAB

d. ADCB

Ans. ABCD

Q.38 What is the time complexity to insert a node based on position in a priority queue?

a. O(n)

b. O(logn)

c. O(nlogn)

d. O(n^2)

Ans. O(n)

Q.39 With respect to deque which of the following is true?

a. Deletion is done only from rear end

b. Insertion is done only from from end

c. Insertion and deletion can be done at front and rear ends

d. Insertion is done only from rear end

Ans. Insertion and deletion can be done at front and rear ends

Q.40 Descending priority queue can be implemented using _____

a. 1

b. 2

c. 3

d. 4

Ans. 2