

Stacks



Queues

MULTIPLE CHOICE QUESTIONS (MCQ's)

For Online Examination (Phase I & II - 50 Marks)

DATA STRUCTURES AND FILES

Second Year Degree Course In
INFORMATION TECHNOLOGY (Sem - II)

Includes

- Sample Ques. Papers for Online Exams (50 Marks)

Dr. SACHIN R. SAKHARE
NITIN N. SAKHARE

A BOOK OF

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SECOND YEAR DEGREE COURSE IN INFORMATION TECHNOLOGY

Strictly According to New Revised Credit System Syllabus
of Savitribai Phule Pune University

(w.e.f June 2016)

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STACKS AND QUEUES

MULTIPLE CHOICE QUESTIONS

1. The term "push" and "pop" is related to the _____.
(a) array (b) lists (c) stacks (d) all of above
Answer: c
2. A data structure where elements can be added or removed at either end but not in the middle is called _____.
(a) linked lists (b) Stacks (c) queues (d) dequeue
Answer: d
3. The Infix equivalent of the prefix $* + ab - cd$ is _____.
(a) $(a+b) * (c-d)$ (b) $(a+b) - (c*d)$ (c) $(a*b)-(c+d)$ (d) $(a-b)*(c+d)$
Answer: a
4. The postfix equivalent of the prefix $* + ab - cd$ is _____.
(a) $ab + cd - *$ (b) $abcd + - *$ (c) $ab + cd * -$ (d) $ab + - cd *$
Answer: a
5. The postfix equivalent of the infix expression $a+b+c+d$ is _____.
(a) $abcd+++$ (b) $ab+c+d+$ (c) $ab+cd++$ (d) $(a-b)*(c+d)$
Answer: b
6. The prefix equivalent of the infix expression $a+b+c+d$ is _____.
(a) $+ab+c+d$ (b) $+++abcd$ (c) $++ab+cd+$ (d) $abcd++++$
Answer: b
7. The postfix equivalent of the infix expression $a+b/c*d-e/f$ is _____.
(a) $ab+cd*/ef-/$ (b) $abcd*+/ef-/$ (c) $ab+cd*/ef/-$ (d) $abc/d*+ef/-$
Answer: d
8. The prefix equivalent of the infix expression $a+b/c*d-e/f$ is _____.
(a) $+abc-*/ef$ (b) $+/*-/abcdef$ (c) $-+a*/bcd/ef$ (d) $+a*/bcd-/ef$
Answer: c
9. The postfix equivalent of the infix expression $a+b/c-d*e-f$ is _____.
(a) $abc/+de*-f-$ (b) $abcd*+/ef-/$ (c) $ab+cd*/ef/-$ (d) $abc/d*+ef/-$
Answer: a

10. The prefix equivalent of the infix expression $a+b/c-d*e-f$ is ____.
- (a) $+abc-*/ef$ (b) $--+a/bc*def$ (c) $-+a*/bcd/ef$ (d) $+a*/bcd-/ef$

Answer: b

11. The infix equivalent of the postfix $ab+cd+ef*-/$ is ____.
- (a) $((a+b)/(c+d))-(e*f)$ (b) $(a+b) - (c+d)/(e*f)$
(c) $(a+b)*(c+d)-(e/f)$ (d) $((a+b)/(c+d))-(e*f)$

Answer: a

12. The infix equivalent of the postfix $ab*cd/+e-$ is ____.
- (a) $a+b*c/d-e$ (b) $a*b+c/d-e$ (c) $(a*b)-(c/d)+e$ (d) $a*b-c/d+e$

Answer: b

13. The prefix equivalent of the postfix $ab*cd/+e-$ is ____.
- (a) $+-/abc*de$ (b) $-+*abc/de$ (c) $-+*ab/cde$ (d) $*ab/+cd-e$

Answer: c

14. Pick the correct prefix form to the given infix expression: $\{a*[b/(c-d)*f]/g\}/[e+h]$
- (a) $/*a/b*-cdfg+ch$ (b) $abcd-f*/g/*eh+/
(c) /*a*/b-cdfg+eh$ (d) $/*ab*/-cdfg+eh$

Answer: c

15. Suppose a circular queue of capacity $(n - 1)$ elements is implemented with an array of n elements. Assume that the insertion and deletion operation are carried out using REAR and FRONT as array index variables, respectively. Initially, $REAR = FRONT = 0$. The conditions to detect queue full and queue empty are
- (a) Full: $(REAR+1) \bmod n == FRONT$, empty: $REAR == FRONT$
(b) Full: $(REAR+1) \bmod n == FRONT$, empty: $(FRONT+1) \bmod n == REAR$
(c) Full: $REAR == FRONT$, empty: $(REAR+1) \bmod n == FRONT$
(d) Full: $(FRONT+1) \bmod n == REAR$, empty: $REAR == FRONT$

Answer: a

16. Consider the usual algorithm for determining whether a sequence of parentheses is balanced. What is the maximum number of parentheses that will appear on the stack AT ANY ONE TIME when the algorithm analyzes: $((())())$
- (a) 4 (b) 3 (c) 2 (d) 6

Answer: b

17. Suppose we have an array implementation of the stack class, with ten items in the stack stored at $data[0]$ through $data[9]$. The SIZE is 42. Where does the push function place the new entry in the array?
- (a) $data[0]$ (b) $data[1]$ (c) $data[9]$ (d) $data[10]$

Answer: c

18. If the characters 'D', 'C', 'B', 'A' are placed in a queue (in that order), and then removed one at a time, in what order will they be removed?

(a) ABCD (b) ABDC (c) DCAB (d) DCBA

Answer: d

19. What data structure is used to perform recursion?

(a) Stack (b) Queue (c) Linked List (d) Arrays

Answer: a

20. For the expression $((A + B) * C - (D - E)/(F + G))$, the equivalent Postfix notation is

(a) $AB + C * DE - - / FG +$ (b) $AB + C * DE - FG + / -$
(c) $AB + C * DE - - FG + /$ (d) $AB + C - DE - * FG + /$

Answer: b

21. Which data structure allows deleting data elements from front and inserting at rear?

(a) Stacks (b) Queues
(c) Deques (d) Binary search tree

Answer: b

22. Identify the data structure which allows deletions at one end of the list but insertion anywhere

(a) Input-restricted deque (b) Output-restricted deque
(c) Priority queues (d) None of above

Answer: c

23. One difference between a queue and a stack is ____.

(a) Queue can be implemented using linked lists, but stack cannot
(b) Stack can be implemented using linked lists, but queues cannot
(c) Queues use two ends of the structure; stacks use only one
(d) Stacks use two ends of the structure, queues use only one

Answer: d

24. Suppose we have a circular array implementation of the queue, with ten items in the queue stored at data[2] through data[11], the current capacity is 12. Where does the insert method place the new entry in the array?

(a) data[1] (b) data[0] (c) data[11] (d) data[12]

Answer: b

25. If we have implemented the queue with a linked list, keeping track of a front node and a rear node with two reference variables. Which of these reference variables will change during an insertion into a NONEMPTY queue?

(a) Neither changes (b) Only front changes
(c) Only rear changes (d) An exception is caused

Answer: c

26. If we have implemented the queue with a linked list, keeping track of a front node and a rear node with two reference variables. Which of these reference variables will change during deletion into NONEMPTY queue?
- (a) Neither changes (b) Only front changes
(c) Only rear changes. (d) An exception is caused

Answer: b

27. If we have implemented the queue with a linked list, keeping track of a front node and a rear node with two reference variables. Which of these reference variables will change during an insertion into a EMPTY queue?
- (a) Neither changes (b) Only front changes
(c) Only rear changes (d) Both front and rear change

Answer: d

28. Queues and Stacks can be implemented using either arrays or linked lists.
- (a) True (b) False

Answer: a

29. In order to input a list of values and output them in order, you could use a Queue.
- (a) True (b) False

Answer: a

30. In order to input a list of values and output them in opposite order, you could use a Stack.
- (a) True (b) False

Answer: a

31. Which of the following is not the type of queue?
- (a) Ordinary queue (b) Single ended queue
(c) Circular queue (d) Priority queue

Answer: a

32. Which is/are the application(s) of stack?
- (a) Function calls (b) Parentheses check
(c) Evaluation of arithmetic expressions (d) All of the above

Answer: d

33. Stack is also called as ____.
- (a) Last in first out (b) First in last out
(c) Last in last out (d) First in first out

Answer: a

34. Queue is also called as ____.
- (a) Last in first out (b) First in last out
(c) Last in last out (d) First in first out

Answer: d

35. ____ is very useful in situation when data have to stored and then retrieved in reverse order.
- (a) Stack (b) Queue (c) List (d) Link list

Answer: a

36. Consider the following pseudo code :

```
declare a stack of characters
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
}
```

What is written to the screen for the input "carpets"?

- (a) serc (b) carpets (c) steprac (d) ccaarrppeettss

Answer: a

37. In the linked list implementation of the stack, where does the push method place the new entry on the linked list?
- (a) Before the first node
(b) At the end of last node
(c) After all other entries that are greater than the new entry.
(d) After all other entries that are smaller than the new entry.

Answer: a

38. What is the value of the postfix expression 6 3 2 4 + - *
- (a) 18 (b) -18
(c) 15 (d) Invalid expression

Answer: b

39. What is the value of the postfix expression $23456^{*+ - /}$
- (a) 16 (b) -18
(c) -15 (d) Invalid expression

Answer: c

40. What is the value of the postfix expression $23456^{*+ -}$
- (a) 16 (b) -18
(c) 15 (d) Invalid expression

Answer: d

41. Here is an infix expression: $4+3*(6*3-12)$. Suppose that we are using the usual stack algorithm to convert the expression from infix to postfix notation. What is the maximum number of symbols that will appear on the stack AT ONE TIME during the conversion of this expression?

- (a) 5 (b) 2 (c) 3 (d) 4

Answer: d

42. 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) $AB + CDE * - *F *G /$

Answer: a

43. A linear list of elements in which deletion can be done from one end (front) and insertion can take place only at the other end (rear) is known as a ____.
- (a) Queue (b) Stack (c) Tree (d) Linked List

Answer: a

44. The data structure required to evaluate a postfix expression is ____.
- (a) Queue (b) Stack (c) Array (d) Linked-list

Answer: b

45. What data structure would you mostly likely see in a nonrecursive implementation of a recursive algorithm?
- (a) Queue (b) Stack (c) Array (d) Linked-list

Answer: b

46. The postfix form of $A*B+C/D$ is ____.
- (a) $*AB/CD+$ (b) $AB*CD/+$ (c) $A*BC+/D$ (d) $ABCD+/*$

Answer: b

47. What is the postfix form of the following prefix $*+ab-cd$
- (a) $ab+cd-*$ (b) $abc+*-$ (c) $ab+*cd-$ (d) $ab+*cd-$

Answer: a

48. Which data structure is needed to convert infix notation to postfix notation?

- (a) Branch (b) Queue (c) Tree (d) Stack

Answer: d

49. What is the result of the following operation done on stack S which is not full?

push (&S, 10); x = pop (&S); where S is a structure containing array and top

- (a) x = -1 (b) x = 10 (c) x = Null (d) Error

Answer: b

50. The prefix form of an infix expression $p + q - r * t$ is ____.

- (a) + pq - *rt (b) - +pqr * t (c) - +pq * rt (d) - + * pqrt

Answer: c

51. The equivalent prefix expression for the following infix expression $(A+B)-(C+D*E)/F*G$ is

- (a) -+AB*/+C*DEFG (b) /-+AB*+C*DEFG
(c) -/+AB*+CDE*FG (d) -+AB*/+CDE*FG

Answer: a

52. The result of evaluating the postfix expression 5, 4, 6, +, *, 4, 9, 3, /, +, * is ____.

- (a) 600 (b) 350 (c) 650 (d) 588

Answer: b

53. The meaning of FIFO is ____ and it stands for ____.

- (a) First In Fast Out, Stack (b) First In First Out, Stack
(c) First In First Out, Queue (d) First In Fast Out, Queue

Answer: c

54. The meaning of LIFO is ____ and it stands for ____.

- (a) Last In First Out, Queue (b) Last In First Out, Stack
(c) Last In Fast Out, Stack (d) Last In First Out, Priority Queue

Answer: b

55. Adding data to stack is called ____.

- (a) Push (b) Pop (c) Insert (d) Delete

Answer: a

56. Items can be removed from both ends of ____.

- (a) queue (b) stack (c) tree (d) dequeue

Answer: d

57. In linked list each node consists of ____.

- (a) data and link to next node (b) data only
(c) link only (d) address of first node

Answer: a

58. In linked lists there are no NULL links in ____.

- (a) circular linked list (b) singly linked list
(c) doubly linked list (d) empty linked list

Answer: a

59. In stack, the command to access the element at top is ____.

- (a) $x = \text{pop}()$; (b) $\text{pop}(x)$; (c) $\text{pop}(\text{top})$; (d) $\text{top} = \text{pop}()$;

Answer: a

60. The result of evaluating prefix expressions $*++ + \text{abcdc}$ where, $a = 1$, $b = 2$, $c = 3$ and $d = 4$ is ____.

- (a) 10 (b) 12 (c) 30 (d) 18

Answer: c

61. The dummy header in linked list contains ____.

- (a) first record (b) last record
(c) link to first record (d) link to last record

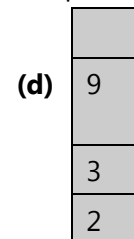
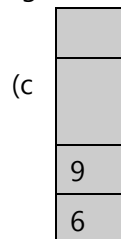
Answer: c

62. If the sequence of operations (push(1), push(2), pop, push(1), push(2), pop, pop, pop, push(2), pop), are performed on a stack, the sequence of popped 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

Answer: a

63. In evaluating the arithmetic expression $2 * 3 - (4 + 5)$, using stacks to evaluate its equivalent post-fix form, which of the following stack configuration is not possible?



Answer: d

64. The postfix expression for the infix expression

$A + B * (C + D) / F + D * E$ is ____.

- (a) $AB + CD + *F / D + E*$ (b) $ABCD + *F / + DE* +$
(c) $A*B + CD / F*DE ++$ (d) $A + *BCD / F*DE ++$

Answer: b

65. Which of the following is essential for converting an infix expression to the postfix form efficiently?

- (a) An operator stack
(b) An operand stack
(c) An operator stack and an operand stack
(d) A parse tree

Answer: a

66. Identify the data structure which allows deletions at one end of the list but insertion at both ends.

- (a) Input–restricted deque (b) Output–restricted deque
(c) Priority queues (d) None of above

Answer: b

67. Identify the data structure which allows deletions at both end of the list but insertion at one end.

- (a) Input–restricted deque (b) Output–restricted deque
(c) Priority queues (d) None of above

Answer: a

68. Identify the data structure which allows deletions as per the priority.

- (a) Input–restricted deque (b) Output–restricted deque
(c) Priority queues (d) dequeue

Answer: c

69. In array implementation of stack stack full condition is ____.

- (a) top equal to one less than size of stack
(b) top is equal to 0
(c) top is equal to NULL
(d) top is equal to -1

Answer: c

70. Which out of these is a non-linear data-structure ____.

- (a) arrays (b) linked-lists (c) queues (d) tree

Answer: d

71. A stack is a data-structure in which elements are stored and retrieved by ____.

- (a) FIFO method (b) LIFO method
(c) FCFS method (d) None of the above

Answer: b

72. The different types of arrays are ____.

- (a) One and Multi-dimensional (b) int and float
(c) int,char, float (d) One and Two dimensional

Answer: c

73. An array is passed into a function ____.

- (a) by value (b) by reference
(c) element by element (d) Any of the above

Answer: b

74. A queue is a data-structure in which elements are stored and retrieved by ____.

- (a) FIFO method (b) LIFO method
(c) FCFS method (d) None of the above

Answer: a

75. If an array with the name, A exists which of the following statements is incorrect

- (a) A++ (b) printf("%d",*(A+1))
(c) printf("%u",A+1) (d) All are correct

Answer: a

76. An uninitialized pointer is known as ____.

- (a) dangling pointer (b) NULL pointer
(c) generic pointer (d) None of the above

Answer: a

77. The unary operator used with pointer variable to indirectly access the contents of memory location pointed to by the pointer is called ____.

- (a) Address-of operator (b) dot operator
(c) indirection operator (d) asterisk operator

Answer: c

Data Structures And Files



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