

Assignment - 2

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| Course Title: | Data Structure | Course Code: | BCS 301 |
| Program: | B. Tech. CSE & AIML (Section A/Section B) | Date of Assignment: | 05/1/24 |
| Semester/Year: | 3 rd /Second | Date of Submission: | 09/1/2024 |

| Q. No. | Questions | CO |
|--------|--|------|
| 1. | Write the pseudocode/algorithms for insertion, deletion and traversing operation in stack using one way linked list . | CO-1 |
| 2. | Convert the given infix expression into postfix expression and evaluate it using stack: $5*(6+2)-12/4$ | CO-1 |
| 3. | <p>(a) Consider the following arithmetic expression P, written in postfix notation: P: 12, 7, 3, -, /, 2, 1, 5, +, *, +</p> <p>(i) translate P by inspection and hand, into its equivalent infix expression.</p> <p>(ii) Evaluate the infix expression.</p> | CO-1 |
| 4. | What is the condition of circular queue to check if circular queue is full. | CO-1 |
| 5. | <p>Consider the following queue where QUEUE is allocated 6 memory cells:</p> <p>FRONT= 2</p> <p>REAR=5</p> <p>QUEUE: __, agra, delhi, kanpur, paris, __</p> <p>Describe the queue, including FRONT and REAR, as the following operations take place:</p> <p>(i) Farah is added</p> | CO-1 |

| | <p>(ii) Two cities are deleted</p> <p>(iii) Mathura is added</p> <p>(iv) Mumbai is added</p> <p>(v) Three cities are deletd</p> <p>(vi) Aligarh is added</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|--|------|------|------|----|----|------|----|---|----|----|----|----|----|---|------|----|----|----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|--|
| 6. | What is Recursion ? Write a recursive procedure to evaluate the factorial of anumber. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | <p>Consider a deque maintained by a circular array with N memory cells.</p> <p>(a) Suppose an element is added to the deque. How is LEFT or RIGHT changed?</p> <p>(b) Suppose an element is deleted. How is LEFT or RIGHT changed?</p> <p>(c) If the element is added to the deque, how is LEFT or RIGHT changed?</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | <p>A linked queue 'Q' and an AVAIL list maintained as a linked stack, are as shown in Fig. 6.34. Trace the contents of the memory after the execution of the following operations on the linked queue Q.</p> <div style="text-align: center;"> <table border="1"> <thead> <tr> <th></th><th>INFO</th><th>LINK</th></tr> </thead> <tbody> <tr><td>23</td><td>56</td><td>NULL</td></tr> <tr><td>24</td><td>8</td><td>29</td></tr> <tr><td>25</td><td>12</td><td>34</td></tr> <tr><td>26</td><td>5</td><td>NULL</td></tr> <tr><td>27</td><td>76</td><td>30</td></tr> <tr><td>28</td><td>123</td><td>31</td></tr> <tr><td>29</td><td>09</td><td>33</td></tr> <tr><td>30</td><td>45</td><td>23</td></tr> <tr><td>31</td><td>23</td><td>26</td></tr> <tr><td>32</td><td>56</td><td>25</td></tr> <tr><td>33</td><td>78</td><td>28</td></tr> <tr><td>34</td><td>123</td><td>24</td></tr> </tbody> </table> <p>Fig. 6.34</p> </div> <p>AVAIL: 32 Linked queue Q: FRONT: 27 REAR: 23</p> <p>(i) Insert 567</p> <p>(ii) Delete</p> <p>(iii) Delete</p> <p>(iv) Insert 67</p> | | INFO | LINK | 23 | 56 | NULL | 24 | 8 | 29 | 25 | 12 | 34 | 26 | 5 | NULL | 27 | 76 | 30 | 28 | 123 | 31 | 29 | 09 | 33 | 30 | 45 | 23 | 31 | 23 | 26 | 32 | 56 | 25 | 33 | 78 | 28 | 34 | 123 | 24 | |
| | INFO | LINK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23 | 56 | NULL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24 | 8 | 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25 | 12 | 34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26 | 5 | NULL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | 76 | 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | 123 | 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29 | 09 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 45 | 23 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | 23 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32 | 56 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | 78 | 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34 | 123 | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| 9. | Write a procedure DELPQL(INFO, PRN, LINK, START, AVAIL, ITEM) which removes an element from the queue and assigns the element to the variable ITEM. | |
| 10. | Let N be an integer and suppose H(N) is recursively defined by $H(N) = \begin{cases} 3 * N & \text{if } N < 5 \\ 2 * H(N - 5) + 7 & \text{otherwise} \end{cases}$ (a) Find the base criteria of H and (b) find H(2), H(8) and H(24). | |

Bloom's Knowledge Level ($K_1, K_2, K_3, K_4, K_5, K_6$)

K_1 – Remember K_2 – Understand K_3 – Apply K_4 – Analyze K_5 – Evaluate K_6 – Create

