**Mid Term Paper-Fall 2023**

**BSCS/BSSE 3rd (Morning/Evening)**

**Data Structures- CSC-201**

**Maximum Points: 18 Total Time: 75 minutes**

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**Instructions: Attempt all Questions and solve all parts of a Question together in a sequence.**

**Question N0. 1 [Points: 3+3]**

1. Convert the following expression from infix to postfix by inspection and hand.

**( ( A \* B / C+ D ) \* ( E – F \* G +H ) ) \* J**

1. If **A=4, B=1, C=2, D=6, E=3, F=1, G=5, H=7 and J=2** then evaluate the postfix expression using symb stack table.

**Question N0. 2 [Points: 3+3]**

Keeping in view the following declarations:

struct DATE { int year, month, day};

struct SCHOOL {char St\_name[30]; DATE registered; SCHOOL \*next;};

SCHOOL \*Head, \*Last, \*Ptr,\*Cpt;

Suppose a linked list already exists (show it by making a diagram) and Head points to its first node.

And last points to last node of the list. write C++ code / algorithm to achieve each of the following objectives:

1. Insert a new element, being pointed by Ptr (new node), before an element pointed by Cpt (points to an existing node in the list).
2. Display names of all the students, registered during 2023.

**Question N0. 3 [Points: 3+3]**

1. Dry run the “ Merge Sort” on the following array to sort it in dececnding order.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 22 | 56 | 12 | 55 | 78 | 51 | 24 | 30 |

1. Being a programmer you are writing a code for a Word Processor, while typing some text in the editor, if someone lost his work done recently, then how it is possible to recover it? Which data structure you prefere in this situation to keep track of work so that it is revertable. Write algorithms for insert and deletion of this data structure.

**\*\*\*\*Good Luck\*\*\*\*\***