DSA Assigment-1

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Answers1:-

```
import java.util.Scanner;
class Student {
    String name;
    int marks;
  Public Student (String name, int marks) {
        this.name = name;
        this.marks = marks;
   }
}
class Stack {
    Private Static class Node {
        Student student;
        Node next;
     Public Node (Student student) {
          this.student = student;
          this.next = null;
      }
   }
  Private Node top;
    Public Stack() {
       top = null;
    }
   Public void Push (Student student) {
        Node newNode = new Node (Student);
        newNode.next = top;
        top = newNode;
   }
   Public Student pop() {
        if (isEmpty()) {
            system.out.println ("Stack is empty");
                return null;
          }
        Student poppedStudent = top.Student;
            top = top.next;
            return poppedStudent;
      }
```

```
Public void display() {
        Node current = top;
        while (current != null) {
            System.out.println("Name" + current.student.name
                               + ", Marks " + current.student.marks);

            current = current.next;

        }
}
Public boolean isEmpty() {
    return top == null;
}
PSVM ( ) {
 Scanner sc = new Scanner(System.in);
  Stack stack = new Stack();
   while(true) {
      sout("\n choose an operation");
      Sout("1. Add a Student");
      Sout("2. Remove a Student);
      Sout("3. Diplay all students);
       Sout("4. Display top3 Students");
        Sout("5. Exit");
        int choice = Scanner.nextInt();
        Scanner.nextLine();
        switch(choice) {
        Case 1: Sout("Enter Student name");
         String name = Scanner.nextLine();
         Sout("Enter Student marks");
         int marks = Scanner.nextInt();
         Stack.push(new Student(name, marks));
          break;
         Case 2: Student removeStudent = Stack.pop();
          if (removedStudent != null) {
          Sout("Removed Student" + removedStudent.name);

          }
          break;
         Case3:
          Sout("students in the Stack");
             stack.display();
              break;
             Case 4;
```

```
Sout ("Feature not implemented yet");
  break;
  Case 5:
  Sout ("Exiting program");
   Sout. ext( 0);
    default:
    System.out.println("Invalid choice. Try again");
    }
  }
}
}
```

(2) Answer:—

Infix Expression : A+B*C-(D/E)
Prefix Notation : +A-*BC/DE
Postfix Notation : ABC*+DE/-
Infix Expression : (A*B)+(C-D)/E
Prefix Notation : +*AB/-CDE
Postfix Notation : AB*CD-E/+
Infix Expression : A*(B+C)/D-E
Prefix Notation : -*A/BCDE
Postfix Notation : ABC+*DE/-
Infix Expression : A+B*(C-D)/E
Prefix Notation : +A/*B-CDE
Postfix Notation : ABCD-*E/+

(3) Answer :— Evaluate the expression : (5+3) X 2-8/4
inside the parentheses, compute the sum : (5+3=8)
Multiply the result by 2 : (8 \times 2 = 16)
divide 8 by 4 : (8/4=2)
Subtract 2 from 16 : (16-2=14)
The value of the expression is 14.

(B) Evaluate the expression : 4x(6+2)-3
inside the parentheses, complete the sum : (6+2=8)
Multiply 4 by 8 : (4 \times 8 = 32)
Subtract 3 from 32 : (32-3=29)
The value of the expression is 29.

(C) Evaluate the expression : 10/2 +3 X5-2
divide 10 by 2 : (10/2=5)

Multiply 3 by 5: (3 \times 5 = 15).
Add 5 and 15: (5 + 15 = 20)
Subtract 2 from 20: (20 - 2 = 18)
The value of the expression is 18.

(1) Evaluate the expression: (7-2) × 4 + 8 / 2
Inside the parentheses, compute the difference (7 - 2 = 5)
Multiply the result by 4: (5 \times 4 = 20)
divide 8 by 2: (8 / 2 = 4)
Add 4 to 20: (20 + 4 = 24)
The value of the expression is 24.

(2) Evaluate the expression: 5 × (3+2) - 7 / 1
Inside the parentheses, compute the sum: (3 + 2 = 5)
multiply 5 by 5: (5 \times 5 = 25).
divide 7 by 1: (7 / 1 = 7)
Subtract 7 from 25: (25 - 7 = 18)
The value of the expression is 18