

## QUESTION 2

a) Given the following JobSearch and Stack ADTs:

```
public class JobSearch {
    private String State;           //Kedah, Kelantan, Perak, Johor
    private int jobField;          //1-Software Developer
                                   //2-Database Administrator
                                   //3-Hardware Engineer
                                   //4-System Analyst
    private char qualification;    //A-Diploma, B-Degree

    //constructors
    //setters
    //getters
    //printer
}

public class Stack {
    public Stack(){. . .}
    public void push(Object elem) {. . .}
    public Object pop(){. . .}
    public boolean isEmpty(){. . .}
}
```

Write code segments for the following:

- i) Declare a Stack object named `jobStack` and insert 50 data into the stack. (5 marks)
- ii) Find and display the information of **Database Administrator** with **Diploma** qualification. (Note: To avoid data loss, use a temporary stack to store the information.) (5 marks)
- iii) Move the data of JobSearch from `jobStack` into two stacks namely `jobKedah` and `jobPerak` for the state of Kedah and Perak respectively while the others remain in `jobStack`. (5 marks)

b) Answer the following questions.

i) Write the prefix notation of the following infix expressions:

- $A / (B + C) / D + E * F$
- $P + Q - R / S * T + U$

(5 marks)

ii) Write the postfix notation of the following infix expressions:

- $A / (B + C) / D + E * F$
- $P + Q - R / S * T + U$

(5 marks)

c) Answer the following questions.

i) Convert the given expression into postfix notation using stack configuration table. Show all the conversion steps.

$$A / B - (C * D - E + F / G) - H$$

(5 marks)

ii) Compute the following postfix notation by showing the sequence of evaluation using stack configuration table:

$$Y = 14 \ 2 / \ 8 * \ 4 / \ 16 + \ 19 + \ 7 /$$

(10 marks)

### QUESTION 3

a) Given an arithmetic expression as follows:

$$(T \ \$ \ U / V) + (W - X * Y + Z)$$

i) Draw the expression tree of the given arithmetic expression.

(5 marks)

ii) Write the **PREORDER** and **POSTORDER** traversal of the above expression tree.

(5 marks)