

ii) Based on the expression tree drawn in (i)

- What is the depth of the tree?
- What is the total number of leaf nodes?
- What is the root node?
- List the tree nodes at level 2.

(5 marks)

b) Given the ADT of JobCandidate, TreeNode and BSTParticipant as shown below.

```
class JobCandidate
{
    private int regNo;
    private String name;           //candidate's name
    private char qualification;    //D-Diploma, S - Degree,
                                  M-Master, P-PhD
    private int age;
    private char gender;         //M-Male, F-Female

    //definition of the other methods, including
    //normal constructor,
    //accessors,
    //mutators,
    //toString()
}

class TreeNode
{
    JobCandidate data;
    TreeNode left, right;
    /** definition of the other methods***/
}

class BSTCandidate
{
    TreeNode root;
    public BSTCandidate () {...}           //constructor
    public void displayDetails () {...}
    public int countCandidate (char){...}

    /** definition of the other methods***/
}
```

Table 1: Job Candidate registration

regNo	Name	Qualification	Age	Gender
3358	MUHAMMAD AZMIL BIN AHMAD	D	22	M
5262	SYAHIRAH BINTI ISMAIL	P	32	F
4221	HUSNA BT ROHA	M	28	F
3395	MUHAMMAD DANIAL BIN NAZIM	S	26	M
3222	DIYANA NUR BINTI HASBI	S	24	F
5256	BATRISYA BINTI DIN	P	35	F
3345	AMIR HAKIM BIN DANIAL	D	25	M
3353	LUQMAN BIN AHMAD	D	25	M

i) Refer to Table 1, draw a binary search tree diagram based on the `regNo` value.

(5 marks)

ii) Refer to the binary search tree diagram in (i).

- a. Produce the INORDER traversal.
- b. Produce the POSTORDER traversal.
- c. How many leaf nodes does the tree have?

(5 marks)

iii) Write the definition for the method `displayDetails()` and its recursive method to display the details of candidate's name in descending order.

(5 marks)

iv) Write the definition for the method `countCandidate(char)` and its recursive method to count and return the total number of candidates for the specified qualification passed through the parameter.

(5 marks)

c) Assume the data have been inserted into a `BSTCandidate` object named `candidateTree` in the application class. Write a program segment to calculate and display total candidates with Masters and PhD qualification.

(5 marks)

END OF QUESTION PAPER