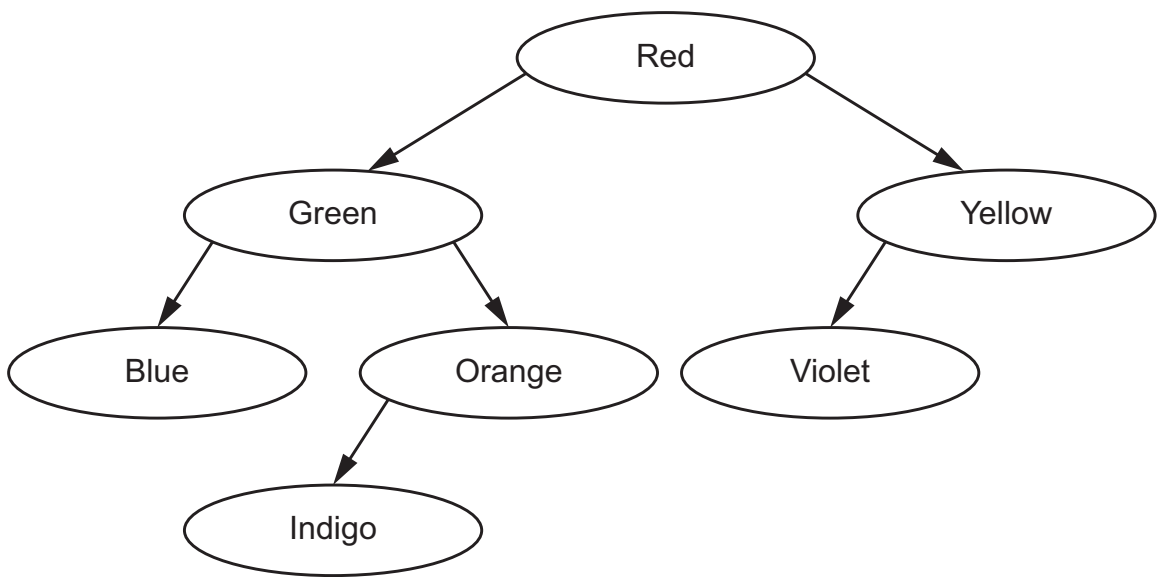


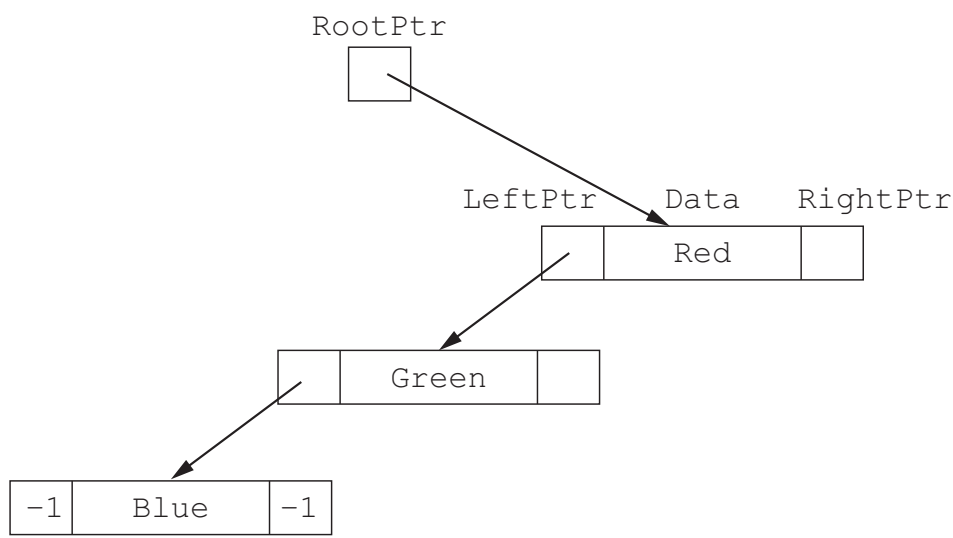
11 The following diagram shows an ordered binary tree.



(a) A linked list of nodes is used to store the data. Each node consists of a left pointer, the data and a right pointer.

-1 is used to represent a null pointer.

Complete this linked list to represent the given binary tree.



[4]

(b) A user-defined record structure is used to store the nodes of the linked list in part (a).

Complete the diagram, using your answer for part (a).

RootPtr	Index	LeftPtr	Data	RightPtr
0	0		Red	
	1		Green	
	2		Yellow	
	3		Blue	
	4		Orange	
	5		Indigo	
	6		Violet	
	7			

FreePtr

[4]

(c) The linked list in part (a) is implemented using a 1D array of records. Each record contains a left pointer, data and a right pointer.

The following pseudocode represents a function that searches for an element in the array of records BinTree. It returns the index of the record if the element is found, or it returns a null pointer if the element is **not** found.

Complete the pseudocode for the function.

```

FUNCTION SearchTree(Item : STRING) .....

    NowPtr ← .....
    WHILE NowPtr <> -1
        IF ..... THEN
            NowPtr ← BinTree[NowPtr].LeftPtr
        ELSE
            IF BinTree[NowPtr].Data < Item THEN
                .....
            ELSE
                RETURN NowPtr
            ENDIF
        ENDIF
    ENDWHILE
    RETURN NowPtr
ENDFUNCTION
  
```

[4]