5) WAP to Implement Singly Linked List with following operations

a) Create a linked list.

b) Deletion of first element, specified element and last element in the list.

Display the contents of the linked list.

```
#include <stdio.h>
#include<stdlib.h>


Typedef struct Node {
   Int data;
   Struct Node *next;
}Node;

Void InsertAtBeginning( Node **head_ref,int new_data);
Void DeleteAtBeginning( Node **head_ref);
Void DeleteAtEnd( Node **head_ref);
Void Delete( Node **prev_node,int pos);
Void PrintList(Node * next);

Void InsertAtBeginning( Node **head_ref,int new_data)
{
   Node *new_node=(struct Node*)malloc(sizeof( Node));
   New_node->data=new_data;
   New_node->next=*head_ref;
   *head_ref=new_node;
}

Void DeleteAtBeginning( Node **head_ref)
```

```
{
   Node *ptr;
If(head_ref == NULL)
{
Printf(“\nList is empty”);
}
Else
{
Ptr = *head_ref;
*head_ref = ptr->next;
Free(ptr);
Printf(“\n Node deleted from the beginning ...”);

}

}



Void DeleteAtEnd(Node **head_ref)
{
   Node *ptr,*ptr1;

If(*head_ref == NULL)

{

Printf(“\nlist is empty”);

}
```

```
Else if((*head_ref)-> next == NULL)

{

Free(*head_ref);

*head_ref= NULL;

Printf("\nOnly node of the list deleted ...");

}

Else

{

Ptr = *head_ref;

While(ptr->next != NULL)

{

Ptr1 = ptr;

Ptr = ptr ->next;

}
```

```
Ptr1->next = NULL;

Free(ptr);

Printf("\n Deleted Node from the last ...");

}

}
Void Delete(Node **head_ref, int pos)
{
   Node *temp = *head_ref, *prev;

   If (temp == NULL)
   {
      Printf("\nList is empty");
      Return;
   }

   If (pos == 1)
   {
      *head_ref = temp->next;
      Free(temp);
      Printf("\nDeleted node with position %d", pos);
      Return;
   }

   For (int i = 0; temp != NULL && i < pos – 1; i++)
   {
```

```
        Prev = temp;
        Temp = temp->next;
    }

    If (temp == NULL)
    {
        Printf("\nPosition out of range");
        Return;
    }

    Prev->next = temp->next;
    Free(temp);
    Printf("\nDeleted node with position %d", pos);
}
Void PrintList(Node *node)
{
    While (node!=NULL)
    {
        Printf("%d\n",node->data);
        Node=node->next;
    }
}


Int main()
{
    Int ch,new,pos;
    Node* head=NULL;
    While(ch!=6)
```

```
{
Printf(“Enter your choice\n”);
Printf(“Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit\n”);
Printf(“Enter your choice\n”);
Scanf(“%d”,&ch);
Switch(ch)
{
  Case 1:
  {
  Printf(“Enter the data you want to insert at beginning\n”);
  Scanf(“%d”,&new);
  InsertAtBeginning(&head,new);
  Break;
  }
  Case 2:
  {
  DeleteAtBeginning(&head);
  Break;
  }
  Case 3:
  {
  Printf(“Enter the position at which you want to delete \n”);
  Scanf(“%d”,&pos);
  Delete(&head,pos);
  Break;
  }
  Case 4:
  {
```

```
        DeleteAtEnd(&head);
        Break;
        }
        Case 5:
        {
           Printf("Created linked list is:\n");
           PrintList(head);
           Break;
        }
        Case 6:
        {
           Return 0;
           Break;
        }
        Default:
        {
           Printf("Invalid data!");
           Break;
        }
        }
}
Return 0;
}
```

Output:

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

1

Enter the data you want to insert at beginning

2

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

1

Enter the data you want to insert at beginning

3

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

1

Enter the data you want to insert at beginning

5

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

1

Enter the data you want to insert at beginning

7

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

2

Node deleted from the beginning ...Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

7

Invalid data!Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

5

Created linked list is:

5

3

2

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

3

Enter the position at which you want to delete

2

Deleted node with position 2Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

4

Deleted Node from the last ...Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

5

Created linked list is:

5

Enter your choice

Menu 1:create 2:Delete at beginning 3:delete at specific position 4:Delete at end 5:Display 6:exit

Enter your choice

6

Process returned 0 (0x0)   execution time : 93.712 s

Press any key to continue.