1. Lets assume address of head of a linked list containing finite elements is sent to the following function. Explain the output of the following function with an example.(Assume there are no syntax errors in code segment) (6 Marks)

```
void action(struct Node** head, int k)
{
    if (k == 0)
        return;

    struct Node* temp = *head;

    int count = 1;
    while (count < (k+1) && temp != NULL) {
        temp = temp->next;
        count++;
    }

    if (temp == NULL)
        return;

    struct Node* target = temp;

    while (temp->next != NULL)
        temp = temp->next;

    temp->next = *head;

    *head = target->next;

    target->next = NULL;
}
```

2. Lets assume start contains address of first node of a linked list. Explain the output of the following function with an example. (Assume there are no syntax errors in code segment) (4 Marks)

```
void action(struct node* start)
{
int temp;
if(start == NULL)
return;

 action(start->next);
temp = start->data;
temp = temp*temp*temp*temp;
  printf("%d  ", temp);
}
```

3. Whats the output of the following program. (Assume there are no syntax errors in code segment) (4 Marks)

```
int main()
{
        int b[][] = {{10,20},{30,40}};
          int t, q;
for (t = 0; t < 2; t++)
for (q = 0; q < 2; q++)
printf("%d ", b[t][q]* b[t][q]);
return 0;
}
```

4. Explain self-referential structure with an example. Why it is used in data structure? (2 Marks)

5. State the differences between arrays and linked lists. (3 Marks)

6. Let A be a two dimensional array declared as follows:
A: array [1 …. 12] [1 ….. 20] of integer;
Assuming that each integer takes one memory location, the array is stored in row-major order and the first element of the array is stored at location 110, what is the address of the element A[i][j]? (6 Marks)