* why we Consider the array as static data
structure?

Because we declare the array size in advance that much bytes or space is reserved in memory and can't be increased later.

رسب لأننا نفله جمعه إصنونة مسبقاً. لذلك يتم عجز هذا العدر مر الباين أو إساعة في لذاكرة ولا يكنه زيادتها لا جفاً.

How to overcome the false overflow problem? when this problem occures?

the false overflow occures when we try to push more items on a stack than it can hold. The false we can over Gome it by put size to stack

نتغلب على بمثلة بوضع عجم المكلاس (Stack) بحين يرثم فحين . (Stack) . المجم في كلاس (Stack) . المجم في كلاس (Stack) .

QUESTION 1:

1.1 Why we consider the array as static data structure? (2 marks)

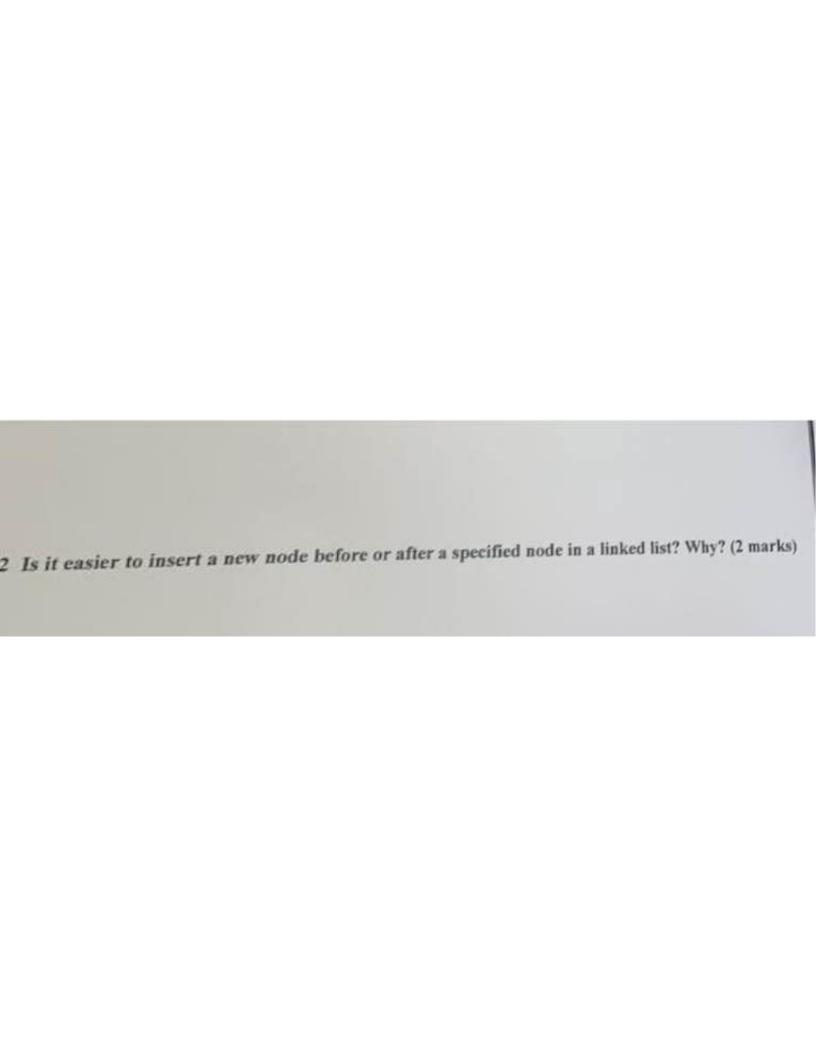
1.2 How to overcome the false overflow problem? When this problem occurs? (3 marks)

Jes. Be cause we have the index of the Specific node, that means we know the pointer of the before and when next node.

in sit eagier to insert a new node before or after a specific why?

Jes. Be cause we have the index of the Specific node, that means we know the pointer of the before and when next node.

in sit is so it is the line of the before and when so it is so i



Direction 1

11

· Insertion in the middle problems:we need to: - 1- Length of the array.

2- mid point index.

3- right shift all the elements from the mid to the end.

وضوع الدرس

4 - overwrite the new element in the mid index.

Problem :- the Shift left all telements P

we need to: 1- Shift left all telements from index 1 to index (n-1)
2-make the Last element" 1 or

W

OUESTION 1:

1.1 What are the problems of performing the following operations in an Array?

• Insertion in the middle

• Removing elements from the beginning

Question 2

* when it is a provo priate to use the data structure linked list? what is the major disaboluoustage of linked list?

موصوع الشوس

1- Dynamic memory Allo Cation.

2- Implementing advanced data Structure 3- Manipulating polynamials.

4- Avi Humetic operations.

The major disadvantage of linked list:

1- more memory required.

2- more Time- Consuming For traversal.

3- Random Access is not possible. 4- Nodes are stored in Contiguously.

QUESTION 2:

[9 marks]

2.1 When it is appropriate to use the data structure Linked List? What is the major disadvantage of

Linked List? (3 marks)

2.3

90 × 400 = 36000 100 × 400 = 40000 Wol 4000

B 60 ×400 = 24000 (00 ×400 = 40000 wol = 16000 Size of

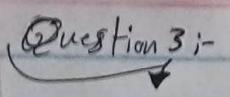
Dreach node of in a Linked list will be 400+1+1 is the size will be (n*400)

linkedlist 2.3

9000 = 36000 9000 = 36000 9000 = 180 36.000 + 180 = 36180

 $60 \times 400 = 24,000$ $60 \times 400 = 120$ 24,000 + 120 = 24120

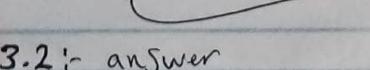
2.3 If the items required all array 90 pe linked list (v	s in a list are structures together and determine rcent full (b) the list is k where the pointers take	taking 400 memory location which data structure you very tept contiguously in an arra one memory location each	ns each, compare the amount of space will use if (a) the list is kept contiguously in a by 60 percent full and (c) the list is kept as a h) (4 marks)	n



3.1 1- answer:

- The worst Case is that you have to look at every item. The

- The worst Case occurs the when the item to be searched is in the end of Array.



3.2: answer 4,8,9,14

- Mid point of (0-14) indexes is 0+14/2 = 7th element that will be 8

- Mid point of one helf of (1-5) is 145/2 = 3th - 11 11 Secondhalf of (6-10) is 6+10/2 = 8th - 11 11 Third half of (11-15) is 11+15/2 = 13th

QUESTION 3:

3.1 What is the worst case of complexity of linear search algorithm? When it occurs? (3 marks)

[6 marks]

3.2 Here is an array with 15 elements:

 $1,\, 2,\, 3,\, 4,\, 5,\, 6,\, 7,\, 8,\, 9,\, 10,\, 11,\, 12,\, 13,\, 14,\, 15$

Suppose that we are doing a binary search for an element. Which elements can be found by making three or less comparisons? (3 marks)

تكون ان اضافه عنصر في المصفوفة انه يستغرق جهد ووقت حتى يتم اضافه عنصر جديد (2 marks)

1.2 What are the impacts of storing huge number of integers in array?

It takes time and effort to save the data in the array