Question 2 [12 marks]:

A factory produces custom widgets according to customer requirements. It has several orders, each for a single widget. For each order, we know the following information:

i) The profit that the factory will make from the order.

ii) The deadline – the last day on which the customer will accept delivery.

The factory can make exactly one widget per day. The following table shows all the orders for a 6-day period:

Order No.	1	2	3	4	5	6	7	8	9	10
Profit	10	20	90	40	50	100	70	80	30	60
Deadline	6	6	1	3	4	1	2	4	3	4

Use the Greedy Approach to determine the orders that the factory should accept for achieving the highest profit, and the schedule for producing the widgets of the accepted orders.

Firstly I would sort the order based on profit in a descending order

Order No.	6	3	7	8	10	5	4	9	2	1
Profit	100	90	70	80	60	50	40	30	20	10
Deadline	1	1	2	4	4	4	3	3	6	6

Now we will iterate through the table and take the highest profit and schedule them as late as possible

First we will take Order No. 6 and put it as late as possible, which is day 1

Day	1	2	3	4	5	6
Order No.	6					
Profit	100					
Deadline	1					

As Order No. 3 expired in deadline, we will take Order No. 7

Day	1	2	3	4	5	6
Order No.	6	7				
Profit	100	70				

Deadline	1	2				

Continuing we will take Order No. 8 and schedule it as late as possible which is day 4

Day	1	2	3	4	5	6
Order No.	6	7		8		
Profit	100	70		80		
Deadline	1	2		4		

Continuing we will take Order No. 10 and schedule it as late as possible which is day 3

Day	1	2	3	4	5	6
Order No.	6	7	10	8		
Profit	100	70	60	80		
Deadline	1	2	4	4		

Continuing we will take Order No. 2 and schedule it as late as possible which is day 6

Day	1	2	3	4	5	6
Order No.	6	7	10	8		2
Profit	100	70	60	80		20
Deadline	1	2	4	4		6

Continuing we will take Order No. 1 and schedule it as late as possible which is day 5

Day	1	2	3	4	5	6
Order No.	6	7	10	8	1	2
Profit	100	70	60	80	10	20
Deadline	1	2	4	4	6	6

So this would be the final answer Order No. [6, 7, 10, 8, 1, 2]