Q1 (Multiple Choice)

You have a line of cards, each with a digit on it. You can discard any number of cards, keeping the rest in their original order.

For instance, given the line 4938, discarding the second and third cards would result in the new number 48.

You start with 11 cards 2 3 8 9 2 7 6 4 5 1 3 and want to make the largest possible 5-digit number.

What is the fourth digit of this new number?

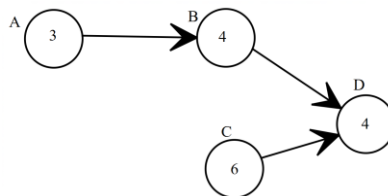(A)   2   (B)   3   (C)   4   (D)   5   (E)   6

Q4 (MC)   Orchards

A farmer intends planting orchards in three fields on his property. The table below shows the activities that have to be completed and the dependencies between them. For instance, activity *A* must be completed before activity *B*, whilst *C* could be done at the same time as *A* or *B*.

Activity	Description	Time	Depends On
A	Remove stump from field 1	3 days	-
B	Weed field 1	4 days	A
C	Weed Field 2	6 days	-
D	Fertilise field 1 and 2	4 days	B, C
E	Weed field 3	7 days	-
F	Fertilise field 3	5 days	E
G	Install irrigation in all fields	3 days	D, F
H	Plant fields 1 and 2	5 days	G
I	Erect trellis in field 3	2 days	G
J	Plant field 3	4 days	I
K	Mulch all three fields	3 days	H, J

The activities and dependencies can also be shown in a diagram. A partial activities diagram is shown below. The numbers inside the circles represent the time taken for the activity, and arrows show the dependencies between the activities.

What is the least number of days required to complete all activities?

(A)   22   (B)   23   (C)   24   (D)   25   (E)   26

Q7 (answers are three digit numbers)

You are collecting wolfram ore from sites along a track. The ore will be carried by donkeys. However, the donkeys have their own ideas of how much they should carry.

- the first donkey loaded does not object to any weight.

- Once one or more donkeys are loaded, the next donkey will not carry a greater weight than any donkey already loaded.

- Once a donkey is loaded, it will refuse to carry any other load.

- At each site, a donkey will accept all or none of the ore available.

- Donkeys will not return to a site they have already passed.

For instance, if there were three sites with ore weights of 4, 7 and 4, and you had two donkeys, you could take the ore with weights 4 and 4, or 7 and 4, but not 4 and 7.

For each of the following, what is the maximum weight of ore you could collect?

a)   Two donkeys

        6 5 5 6 3 7 4 8 2 9 2 1

b)   Three donkeys

        6 5 5 6 3 7 4 8 2 9 2 1

c)   As many donkeys as you like

        4 4 6 3 7 4 9 4 5 4