

01 A heap of stones can be made up into groups of 21. When made up into groups of 16, 20, 25 and 45, there are 3 stones left in each case. How many stones at least can there be in the heap ?

$$\text{L.C.M. of } 16, 20, 25, 45 = 3600$$

$$1^{\text{st}} \text{ number} = 3600 \times 1 + 3$$

$$= 3603 \text{ which is not divisible by } 21$$

$$2^{\text{nd}} \text{ number} = 3600 \times 2 + 3$$

$$= 7203 \text{ which is divisible by } 21$$

02 How many 4-digit numbers are multiples of 4 and 5 ?

The smallest 4-digit number which is a multiple of 4 and 5 is 1000. The largest 4-digit number which is a multiple of 4 and 5 is 9980

$$\therefore 9980 - 1000 = 8980$$

$$\Rightarrow 8980 \div 20 = 449$$

$$= 449 + 1$$

$$= 450$$

03

A five digit number $7a69b$ is a multiple of 18. Find the digits a and b if the number is to be as small as possible.

Since $18 = 2 \times 9$, the 5-digit number must be a multiple of 9

To be as small as possible, let $a = 0$,

then $7 + 0 + 6 + 9 + b = 27 \Rightarrow b = 5$

But, b must be an even number. Hence, $a \neq 0$

Now, let $a = 1$, then $7 + 1 + 6 + 9 + b = 27$

$b = 4$

$\therefore a = 1$ and $b = 4$

04

At bus depot, bus A leaves every 20 minutes, bus B leaves every 15 minutes and bus C leaves every 12 minutes. If the three buses leave together at 7: 30 a.m. When will they next leave the bus depot together again ?

$$\begin{array}{r|l} 3 & 20, 15, 12 \\ \hline 5 & 20, 5, 4 \\ \hline 2 & 4, 1, 4 \\ \hline 2 & 2 \ 1 \ 2 \\ \hline & 1 \ 1 \ 1 \end{array}$$

L.C.M. $3 \times 5 \times 2 \times 2 = 60 \text{ min} = 1 \text{ h}$

Hence, the required time = $7: 30 + 1 \text{ h}$

= 8: 30 a.m.

05

45 students from India, 60 from China and 30 from Japan attend an Asian Students' Conference.

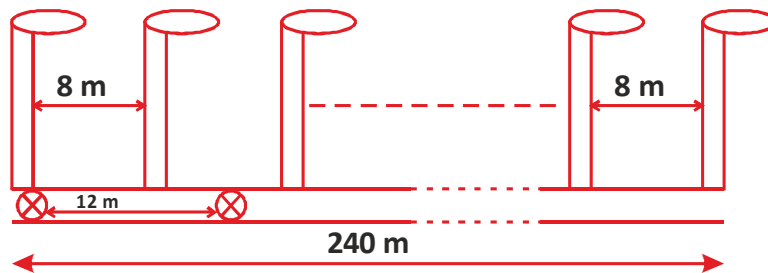
- (i) What is the greatest number of discussion groups that can be formed such that the students from each country are distributed equally among all the groups ?
- (ii) How many students from each country will there be in each group ?

$$\begin{array}{r|l} 3 & 45, 60, 30 \\ 5 & 15, 20, 10 \\ \hline & 3 \quad 4 \quad 2 \end{array}$$

- (i) H.C.F. = $3 \times 5 = 15 = 15$ groups
- (ii) There are 3 India students, 4 China students and 2 Japan students in each group

06

Lamp poles are installed along the road side on every 8 m. Markings are made on the road side on every 12 m. How many markings are made besides the lamp poles along a 240 m long road.



$$\begin{array}{r|l} 2 & 8, 12 \\ 2 & 4, 6 \\ \hline & 2, 3 \end{array}$$

- L.C.M. (8, 12) = $2 \times 2 \times 2 \times 3 = 24$
 Number of 24 m interval within the 240 m long road is = $240 \div 24 = 10$
 Number of marking = $10 + 1 = 11$
 Therefore, there are 11 markings that are besides lamp poles

07 Manu has two electronic beepers. One of them beeps every 4 seconds; the other beeps every 9 seconds. If they are turned on at exactly the same time, how many times during the next hour will both beepers beep at the same time ?

Since, 36 is the L.C.M. of 4 and 9, the beepers will beep together every 36 seconds

One hour = 60 minutes = 3600 seconds, and so the simultaneous beeping will occur 100 times

08 When a 3-digit number is written two times, it becomes a 6-digit number. Show that it can be divisible by 7.

Let the 3 digit number be xyz

then, the 6-digit number is $xyzxyz$

$$xyzxyz = 1000 \times xyz + xyz$$

$$= 1001xyz$$

$$= 7 \times 11 \times 13xyz$$

hence 7 divides $xyzxyz$