ANSWER KEY

1	(B)$3\sqrt{3}$
2	(B)2
3	(A)13
4	(C)81
5	(D)120
6	(B)235
7	(C)6
8	(C)35
9	(D) A is false and R is True
10	(D) A is false and R is True
11	Required number = Lcm(28,32) − Sum of remainder Lcm (28,32) = $2 \times 2 \times 2 \times 2 \times 2 \times 7 = 224$ $\begin{array}{r\|l} 2 & 28, 32 \\ 2 & 14, 16 \\ 2 & 7, 8 \\ 2 & 7, 4 \\ 2 & 7, 2 \\ 7 & 7, 1 \\ & 1, 1 \end{array}$ Sum of remainder $(\cancel{12+20})$ $(8+12)$ $= 20$ $N = 224 - 20$ $= 204$ OR LCM(15,24,36)= 360 $\begin{array}{r\|l} 2 & 15, 24, 36 \\ 2 & 15, 12, 18 \\ 2 & 15, 6, 9 \\ 3 & 15, 3, 9 \\ 3 & 5, 1, 3 \\ 5 & 5, 1, 1 \\ & 1, 1, 1 \end{array}$ $\begin{array}{r} 27 \\ 360 \overline{)9999} \\ 720\downarrow \\ 2799 \\ 2520 \\ \hline 279 \end{array}$ $\cancel{9999 - 99 = 9900}$ 9999 − 279 = 9720 is the number. Ans.
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	Given; LCM = 14 HCF → I LCM + HCF = 600 → II Put (I) in (II) 14 HCF + HCF = 600 15 HCF = 600 HCF = $\frac{600}{15}$ $\boxed{HCF = 40}$ LCM = 14 HCF = 14 × 40 $\boxed{LCM = 560}$ We know, HCF × LCM = a × b 560 × 40 = 280 × b $\frac{{}^{2}\cancel{560} \times 40}{\cancel{280}} = b$ ⇒ $\boxed{b = 80}$
13	$64 = 2^6$ $80 = 2^4 \times 5$ $96 = 2^5 \times 3$ LCM = $2^6 \times 3 \times 5 = 64 \times 3 \times 5$ = 960 cm. The least length of cloth can be measured exactly using any of the rods is 960 cm.

	$\boxed{\text{OR}}$ We will find LCM of 4, 7 and 14. $\begin{array}{r\|l} 2 & 4, 7, 14 \\ 2 & 2, 7, 7 \\ 7 & 1, 7, 7 \\ & 1, 1, 1 \end{array}$ LCM (4, 7, 14) = 28 ∴ At 6:28 am, the three bells will ring together next.
14	Given: The number is $\frac{1}{\sqrt{2}+5}$ $\frac{1}{\sqrt{2}+5} = \frac{1 \times \sqrt{2}-5}{\sqrt{2}+5 \times \sqrt{2}-5} = \frac{\sqrt{2}-5}{4-25} = \frac{\sqrt{2}-5}{-21}$ $= -\frac{(\sqrt{2}-5)}{21}$ $= \frac{5-\sqrt{2}}{21}$ let us assume $\frac{5-\sqrt{2}}{21}$ is rational $\Rightarrow \frac{5-\sqrt{2}}{21} = \frac{a}{b}$ [a & b are co-prime, $b \neq 0$] $5-\sqrt{2} = \frac{21a}{b}$ $-\sqrt{2} = \frac{21a}{b} - 5$ $-\sqrt{2} = \frac{21a-5b}{b}$ $\sqrt{2} = \frac{21a-5b}{-b}$ [$\frac{p}{q}$ form, $q \neq 0$] p & q → co-prime Here, Rational = Irrational which is not possible. Hence, our assumption is wrong. $\frac{1}{\sqrt{2}+5}$ is irrational.
15	

	$1251 - 1 = 1250$ $9377 - 2 = 9375$ $15628 - 3 = 15625$ $(1250, 9375, 15625) = 625$ largest no. $= 625$ OR $LCM + HCF = 1260 \rightarrow I$ $LCM = HCF + 900 \rightarrow II$ Put II in I: $HCF + 900 + HCF = 1260$ $2HCF + 900 = 1260$ $2(HCF + 450) = 1260 \Rightarrow HCF + 450 = 630$ $\boxed{HCF = 180}$ $LCM = HCF + 900$ $\Rightarrow LCM = 180 + 900$ $LCM = 1080$ $HCF \times LCM = a \times b$ $HCF \times LCM = 1080 \times 180$ $= 194400$ Ans.
16	16 i) We will find HCF. Small $= 48 = 2 \times 3 \times 2^3 = \boxed{2^4 \times 3}\ cm^2$ Medium $= 12 \times 24 = 2 \times 2 \times 3 \times 2 \times 2 \times 2 \times 3$ $= \boxed{2^5 \times 3^2}\ cm^2$ Large $= 24 \times 36 = 2^3 \times 3 \times 2^2 \times 3^2$ $= \boxed{2^5 \times 3^3}\ cm^2$ Extra large $= 36 \times 48 = 2^2 \times 3^2 \times 2^4 \times 3$ $= \boxed{2^6 \times 3^3}\ cm^2$ $XXL = 48 \times 96 = 2^4 \times 3 \times 2^4 \times 3 \times 2$ $= 2^4 \times 3 \times 2^4 \times 3 \times 2$ $= \boxed{2^9 \times 3^2}\ cm^2$ $HCF = 2^4 \times 3 = 48$ (We have found HCF of areas of all different types of cartons) Maximum Size of ~~max~~ $= 48\ cm^2$ ~~inform~~ sheet ii The Area of semi-large carton is b/w 288 cm^2 and 864 cm^2

17 (i)

Greatest no of students in each row = HCF (480, 640)

$$\begin{array}{r|l} 2 & 480, 640 \\ 2 & 240, 320 \\ 2 & 120, 160 \\ 2 & 60, 80 \\ 2 & 30, 40 \\ 5 & 15, 20 \\ & 3 \quad 4 \end{array}$$

$= 32 \times 5$

$= 160.$

(ii)

Rows required for girls $= \frac{480}{160} = 3$ rows

Rows required for boys $= \frac{640}{160} = 4$ rows

Total number of rows $= 4 + 3 = 7$ rows

(iii)A

LCM (480, 640)

$\Rightarrow$ LCM $= 2^7 \times 5 \times 3$

$= 1920$

LCMx HCF = 480X 640

(iii)B

We need to find LCM of 45 and 60 = 180(using prime factorisation)

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Let us assume $\sqrt{5}$ is rational. ($\sqrt{5} = \frac{p}{q}$, $q \neq 0$ p & q are co-prime)

$\sqrt{5} = \frac{p}{q}$

$\sqrt{5}q = p$

Squaring on both sides:

$5q^2 = p^2 \rightarrow \text{I}$

$q^2 = \frac{p^2}{5} \rightarrow \text{II}$

As 5 divides, p^2, 5 divides p also.

$\Rightarrow \frac{p}{5} = k$

$p = 5k \rightarrow$ Put in (I)

$5q^2 = (5k)^2$ $\qquad$ ~~$q^2 = \frac{25k^2}{5}$~~

$5q^2 = 25k^2$

$q^2 = 5k^2$

$\frac{q^2}{k^2} = 5$

$\Rightarrow \frac{q^2}{5} = k^2$

	As 5 divides q^2, 5 divides q also. As 5 divides both p and q, this contradicts our assumption that p & q are co-prime. Hence, our assumption is wrong. $\sqrt{5}$ is ~~is~~ irrational.
19	Let us assume $\sqrt{2}+\sqrt{3}$ is rational ($\Rightarrow \sqrt{2}+\sqrt{3}=\frac{p}{q}$, $q\neq 0$ p & q are co-prime Squaring both sides $(\sqrt{2}+\sqrt{3})^2 \Rightarrow 2+3+2\sqrt{6} \Rightarrow 5+2\sqrt{6}$ $5+2\sqrt{6}=\frac{p^2}{q^2}$ $2\sqrt{6}=\frac{p^2}{q^2}-5$ $2\sqrt{6}=\frac{p^2-5q^2}{q^2}$ $\sqrt{6}=\frac{p^2-5q^2}{2q^2}$ Here, Irrational = Rational (which isn't pos Hence, our assumption is wrong. $\sqrt{2}+\sqrt{3}$ is irrational.

________________________End______________________