UDAAN

2026

REAL NUMBERS

MATHS LECTURE-2

BY-RITIK SIR

Topics *to be covered*

#GPU

A Questions on HCF, LCM, Prime numbers, Composite numbers

B Relation between HCF and LCM of two numbers

C Coprime numbers

Next class

QUESTION

#Q. Find the HCF and LCM of 144, 180 and 192 by the prime factorization method.

$144 = 2^4 \times 3^2 \times 5^0$

$180 = 2^2 \times 3^2 \times 5^1$

$192 = 2^6 \times 3^1 \times 5^0$

$HCF = 2^2 \times 3^1 \times 5^0$

$= 12$

$LCM = 2^6 \times 3^2 \times 5^1$

$= 2880$

2	144
2	72
2	36
2	18
3	9
3	3
	1

2	180
2	90
5	45
3	9
3	3
	1

2	192
2	96
2	48
2	24
2	12
2	6
3	3
	1

(A) 12, 280

(B) 12, 2880

(C) 14, 2880

(D) NOTA

Prime Numbers

only two factors.

$5 \to 1, 5$

$2 \to 1, 2$

$13 \to 1, 13$

$19 \to 1, 19$

Composite Numbers

more than '2' factors

$12 \to 1, 2, 3, 4, 6, 12$

Q 21 → $\boxed{\text{composite no.}}$

$21 \to 1, 3, 7, 21$

Q 1 ⭐

$1 \to 1$

$\boxed{\text{neither prime nor composite}}$

#GPK

#Q. If $a = 2^2 \times 3^x$, $b = 2^2 \times 3 \times 5$, $c = 2^2 \times 3 \times 7$, and LCM (a, b, c) = 3780, then x =

A 0

B 1

C 2

D 3

$a = 2^2 \times 3^x \times 5^0 \times 7^0$

$b = 2^2 \times 3^1 \times 5^1 \times 7^0$

$c = 2^2 \times 3^1 \times 7^1 \times 5^0$

LCM (a, b, c) = 3780

$\text{LCM} = 2^2 \times 3^x \times 5^1 \times 7^1$

$3780 = 2^2 \times 3^x \times 5^1 \times 7^1$

$\boxed{2^2 \times 3^3 \times 5^1 \times 7^1 = 2^2 \times 3^x \times 5^1 \times 7^1}$

3

2	3780
2	1890
5	945
3	189
3	63
3	21
7	7
	1

#Q. If the HCF of 85 and 153 is expressible in the form $85n - 153$ then the value of n is

(A) 3

(B) 2

(C) 4

(D) 1

$$\begin{array}{r|l} 5 & 85 \\ \hline 17 & 17 \\ & 1 \end{array} \qquad \begin{array}{r|l} 3 & 153 \\ \hline 3 & 51 \\ 17 & 17 \\ & 1 \end{array}$$

$85 = 5^1 \times 17^1 \times 3^0$

$153 = 3^2 \times 17^1 \times 5^0$

$HCF = 3^0 \times 17^1 \times 5^0$

$= 1 \times 17 \times 1 = 17$

$HCF = 85n - 153$

$17 = 85n - 153$

$17 + 153 = 85n$

$170 = 85n$

$\frac{170}{85} = n$

$2 = n$

#Q. The HCF of smallest prime number and the smallest composite number is:

(A) 2

(B) 4

(C) 6

(D) 8

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 . . .

Smallest prime no.

composite no.

$$\begin{array}{r|l} 2 & 2 \\ \hline & 1 \end{array} \qquad \begin{array}{r|l} 2 & 4 \\ \hline 2 & 2 \\ & 1 \end{array}$$

$HCF(2,4) = 2^1$

$2 = 2^1$

$4 = 2^2$

#Q. The LCM of the smallest two digit composite number and the smallest composite number is:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 ......

Smallest two digit composite no.

A 12

B 20

C 4

D 44

$LCM(4,10) = 2^2 \times 5^1 = 20$

$4 = 2^2 \times 5^0$

$10 = 2^1 \times 5^1$

#Q. $\boxed{\text{The least}}$ number that $\boxed{\text{is divisible}}$ by $\boxed{\text{all the numbers form 1 to 10}}$ (both $\boxed{\text{inclusive}}$)

→ Jo divide hojaye.

A) 10

B) 100

C) 504

D) 2520

$1 = 1^1$

$2 = 2^1$

$3 = 3^1$

$4 = 2^2$

$5 = 5^1$

$6 = 2^1 \times 3^1$

$LCM = 2^3 \times 3^2 \times 5^1 \times 7^1$

2520

2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
2	1, 1, 3, 2, 5, 3, 7, 4, 9, 5
2	1, 1, 3, 1, 5, 3, 7, 2, 9, 5
3	1, 1, 3, 1, 5, 3, 7, 1, 9, 5
3	1, 1, 1, 1, 5, 1, 7, 1, 3, 5
5	1, 1, 1, 1, 5, 1, 7, 1, 1, 5
7	1, 1, 1, 1, 1, 1, 7, 1, 1, 1
	1, 1, 1, 1, 1, 1, 1, 1, 1, 1

$HCF = 5^0 \times 7^0 = 1$

$5 = 5^1 \times 7^0$

$LCM = 5^1 \times 7^1 = 35$

$7 = 7^1 \times 5^0$

a, b

Primes

$HCF(a,b) = 1$

$LCM(a,b) = a \times b$

alg-alg.

#Q. If p and q are two distinct prime numbers, then their HCF is

A 2

B 0

C Either 1 or 2

D 1

#Q. If p and q are two distinct numbers, then their LCM (p, q) is

A) 1

B) p

C) q

D) pq

#Q. Let n be a natural number. Then, the LCM (n, n + 1) is

$5 = 5^1 \times 2^0 \times 3^0$

$6 = 2^1 \times 3^1 \times 5^0$

$(6, 6+1) \rightarrow (6, 7)$

$(5, 6)$

(A) n

(B) n + 1

$LCM = 2^1 \times 3^1 \times 5^1$

(C) n(n + 1)

$= 6 \times 5 = 30$

(D) 1

#Q. Let $\boxed{p \text{ be a prime number.}}$ The sum of its factors is:

5 → 1, 5

7 → 1, 7

p → 1, p

A p

B 1

C p + 1

D p – 1

$1 + p$

8 → 1, 2, 4, 8 $1+2+4+8$

Sum of its factors = 15

#Q. The LCM of two prime numbers p and q $(p > q)$ is 221. Find the value of $3p - q$.

(A) 4

(B) 28

(C) 38

(D) 48

$$\boxed{\text{LCM}(p, q) = p \times q}$$

$$p > q$$

$$221 = p \times q$$

$$\boxed{17 \times 13 = p \times q}$$

$$\begin{array}{c|c} 13 & 221 \\ \hline 17 & 17 \\ & 1 \end{array}$$

$= 3p - q$

$= 3(17) - 13$

$= 51 - 13$

$= 38$

#Q. $\boxed{\text{Find the greatest number}}$ which divides 85 and 72 leaving remainder 1 and 2 respectively.

$$\boxed{\begin{array}{ll} \bigcirc & \div 85 \longrightarrow R=1 \\ & \div 72 \longrightarrow R=2 \end{array}}$$

$$\begin{array}{r|l} 2 & 84 \\ \hline 2 & 42 \\ 3 & 21 \\ 7 & 7 \\ & 1 \end{array} \qquad \begin{array}{r|l} 2 & 70 \\ \hline 5 & 35 \\ 7 & 7 \\ & 1 \end{array}$$

$$\bigcirc \begin{array}{l} \div 84 \longrightarrow \\ \div 70 \longrightarrow \end{array} R=0$$

$84 = 2^2 \times 3^1 \times 7^1 \times 5^0$

$70 = 2^1 \times 5^1 \times 7^1 \times 3^0$

$HCF = 2^1 \times 3^0 \times 5^0 \times 7^1$

$= 14$

#Q. Find the largest number which on dividing 1251, 9377 and 15628 leaves remainders 1, 2 and 3 respectively.

A) 620

B) 625

C) 600

D) 5

$\bigcirc \div 1251 \rightarrow R = 1$

$\div 9377 \rightarrow R = 2$

$\div 15628 \rightarrow R = 3$

HCF

$$\boxed{\left.\begin{array}{l}\bigcirc \div 1250 \\ \div 9375 \\ \div 15625\end{array}\right] R = 0}$$

$$\begin{array}{r|r} 5 & 15625 \\ \hline 5 & 3125 \\ 5 & 625 \\ 5 & 125 \\ 5 & 25 \\ 5 & 5 \\ & 1 \end{array}$$

$4680-17=4663$ $\bigcirc+17$

#Q. Find the smallest number which increased by 17 is exactly divisible by both 520 and 468.

(A) 4663

(B) 4720

(C) 4680

(D) None of the above

$520 = 5^1 \times 2^3 \times 13^1 \times 3^0$

$468 = 2^2 \times 3^2 \times 13^1 \times 5^0$

$LCM(520, 468) = 2^3 \times 5^1 \times 13^1 \times 3^2$

$= 8 \times 5 \times 13 \times 9$

$= 360 \times 13$

$= \boxed{4680}$

$$\begin{array}{r|l} 5 & 520 \\ \hline 2 & 104 \\ 2 & 52 \\ 2 & 26 \\ 13 & 13 \\ & 1 \end{array} \qquad \begin{array}{r|l} 2 & 468 \\ \hline 2 & 234 \\ 3 & 117 \\ 3 & 39 \\ 13 & 13 \\ & 1 \end{array}$$

#Q. If 'p' and 'q' are natural numbers and 'p' is the multiple of 'q', then what is the HCF of 'p' and 'q'?

#GPk

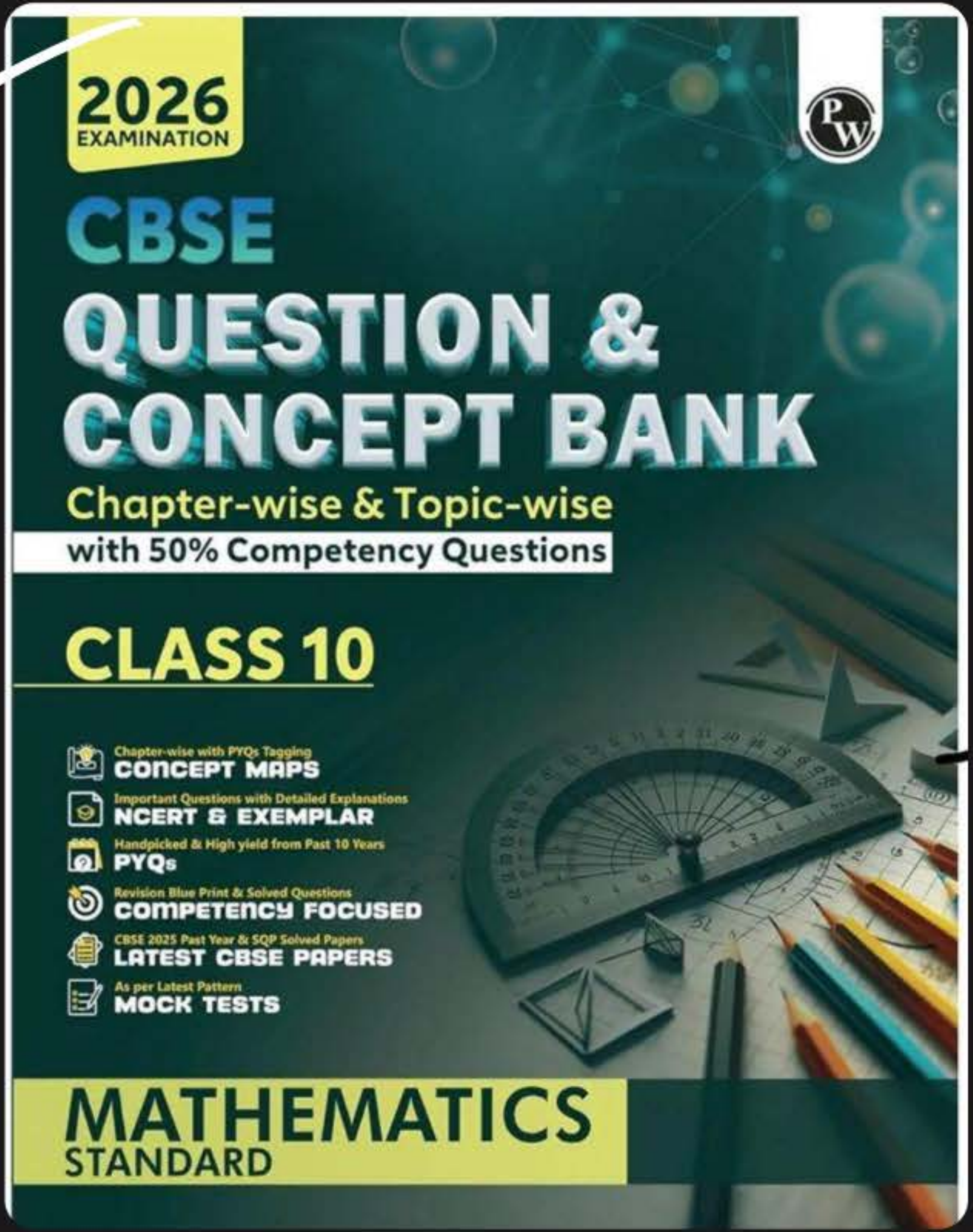
A pq

B p

C q

D p + q

Khajana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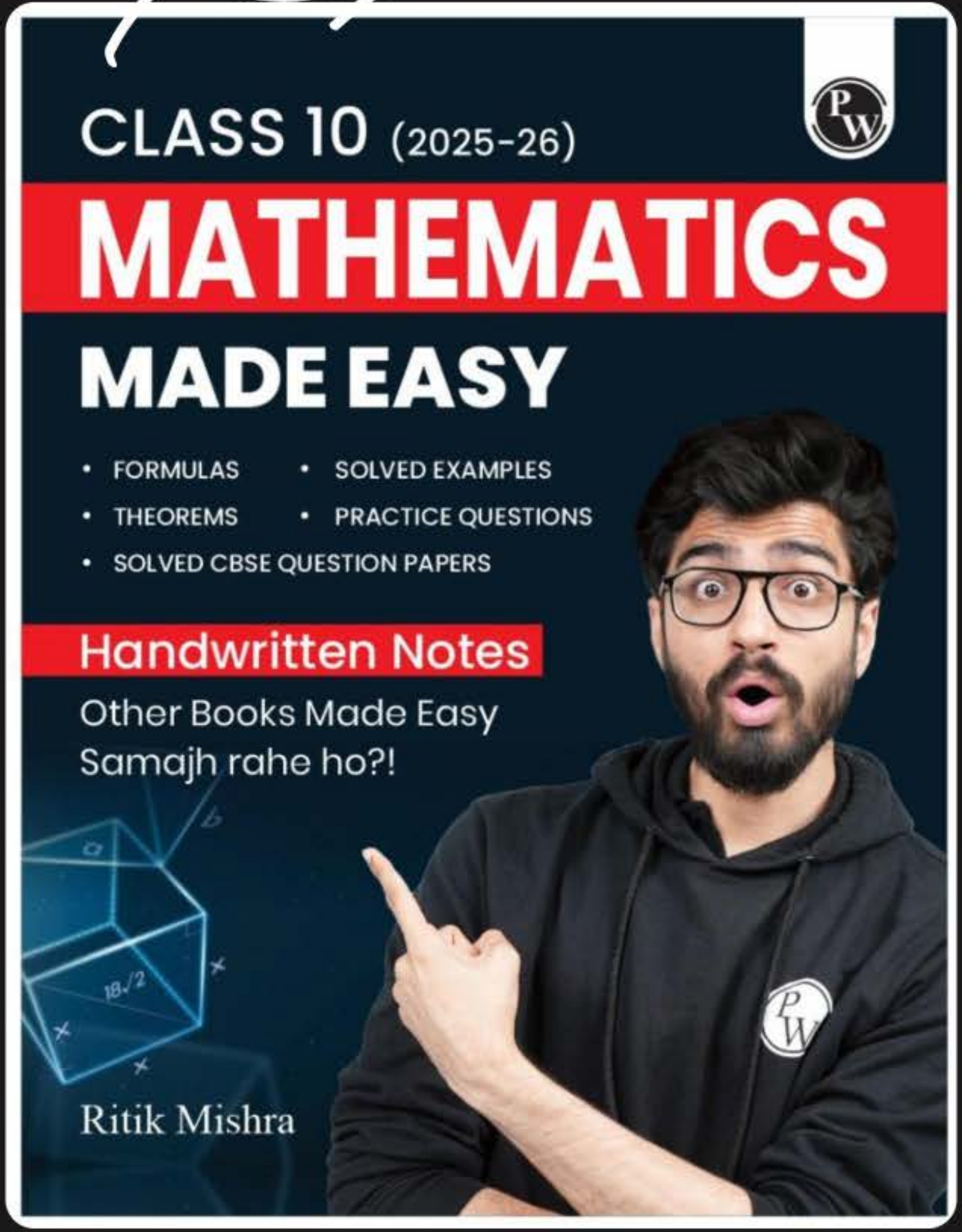
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