

## General Apti

10 Marks

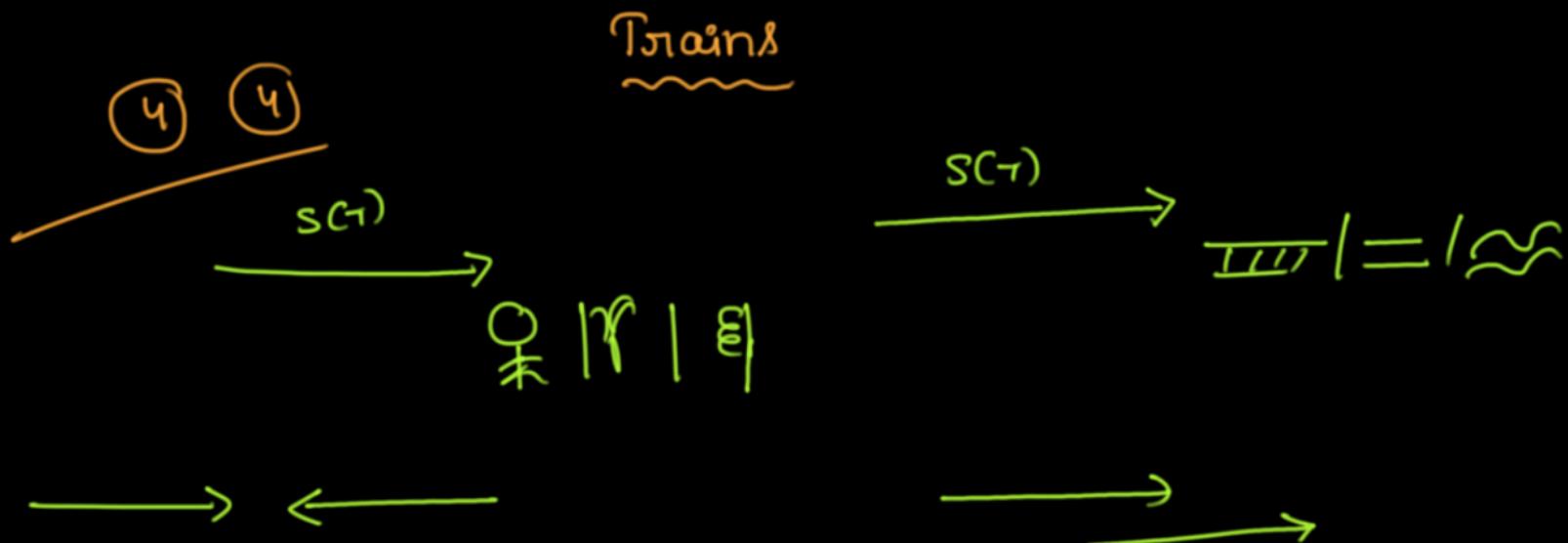
<del>Reasoning 2/3</del>	<del>Quant 2/3</del>	<del>Simplifications 1/2</del>	<del>10.1 (1/2)</del>	<del>spatial Aptitude (2 min)</del>
Letter Number Coding Directions B. Relations  =CUBE/DICE missing no Seating Analytical figures	Tlwork } 1/2 Tltest } 2 min  S.I & C.I } Percentage } Profit loss }  Ratio, Alligation	Go - S. cuts Indices Surds Progressions Number system Log	Pie-chart Bar-chart Table-chart Line-chart	mirror Image water Image Paper folding punched figure - series Analogy odd man out — combined → hidden

Time & Distance [9] Times

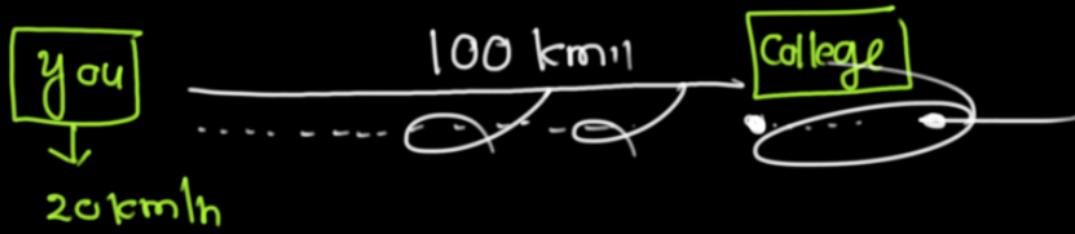
Train [3]

Boat [1]

Trunk [5]



coding  
meeting



$$L(T) = m$$

$$S(T) = km/m$$

$$L(T) \xrightarrow{m} km$$

$$km/m \xrightarrow{} m^1 J$$

Trains

## MODEL : 1 CONVERSION

TRAINS

KM /HR CHANGE IN TO M/S

$$\text{Km/hr} \rightarrow \frac{5}{\cancel{1000}} \cdot \frac{\cancel{60 \times 60}}{3}$$

$$= \frac{5}{18} \text{ m/s}$$

max → small

Small → max

$$km/h \times \frac{5}{18} = m/s$$

$$m/s \times \frac{18}{5} = km/h$$

$$\begin{array}{r} 10 \\ + 15 \\ - 20 \end{array} \begin{array}{r} m/s \\ \times \frac{18}{5} \\ \hline 36 \\ 54 \\ 72 \end{array}$$

$$\begin{array}{r} 6 \\ 7 \\ 8 \end{array} \begin{array}{r} km/h \\ \times \frac{5}{18} \\ \hline 30 \\ 35 \\ 40 \end{array}$$

Model:2:

$$\longrightarrow \text{कर्मिक विभाग}$$

$$T = \frac{\theta}{S}$$

$$\boxed{\text{Time} = \frac{L(T)}{S(T)}} \quad \checkmark$$

**MODEL : 2**

## TRAINS

A train running with the speed of  $S(t)$  and cross the tree /electric pole /man .....  
then time taken to cross the object is ?



or



or

$$\text{TIME} = \frac{\text{LENGTH OF TRAIN}}{\text{SPEED OF TRAIN}}$$

250 m long train running with the speed of  $\frac{72}{18} \text{ km/hr}$  and cross  
the man. find time taken to cross the man?  $\downarrow$

$$\frac{72}{18} \times \frac{5}{18} = 20$$

$$\frac{250}{20} = 12.5 \text{ sec}$$

✓

A Train running with the speed of 126 km/h and crosses the electrical pole in 20 sec. Find length of Train?

$$\Rightarrow 20 = \frac{L[T]}{35}$$

$$\underline{\underline{L[T] = 700 \text{ m}}} \quad \checkmark$$

### Model 3:

→ III | = | wave

$$\text{Time} = \frac{L(T) + L(\text{obj})}{S(T)}$$

**MODEL : 3**

## TRAINS

A train running with the speed of  $S(t)$  , and cross the bridge/platform/caves/tunnels etc....  
then time taken to cross the object is !!!



$$\text{TIME} = \frac{L[\text{TRAIN}] + L[\text{OBJECT}]}{S[\text{TRAIN}]}$$

200m long train running with the speed of 108km/h and cross the  
250m platform, find time taken to cross the platform?

$$T = \frac{200 + 250}{30} = \frac{450}{30} = \underline{\underline{15 \text{ sec}}}$$

$$108 \times \frac{5}{18} = \underline{\underline{30 \text{ m/s}}}$$

A train running with the speed of 126 km/hr and cross the 95 m length of bridge  
in 10 sec. find length of train?

$$10 = \frac{L(T) + 95}{35}$$

$$350 = L(T) + 95$$

$$\begin{aligned} L(T) &= 350 - 95 \\ &= \underline{\underline{255}} \end{aligned}$$

$$T = \frac{\theta}{8}$$
$$T = \frac{1(C_{11}) + 1(C_{22})}{2}$$

$$T = \frac{\theta}{4}$$

MODEL : 4

## TRAINS

IF TWO TRAINS ARE RUNNING IN OPPOSITE DIRECTION, THEN TIME TAKEN TO CROSS EACH OTHER !!!!



$$\text{TIME} = \frac{L[T_1] + L[T_2]}{S[T_1] + S[T_2]}$$

Q1

$$\frac{\text{Sum of CL}}{\text{Sum of Sp}}$$

## MODEL : 5      SAME DIRECTION

## TRAINS

IF TWO TRAINS ARE RUNNING IN SAME DIRECTION , THEN TIME TAKEN TO CROSS THE SLOWEST TRAIN IS ?



$$\text{TIME} = \frac{L[T_1] + L[T_2]}{S[T_1] \sim S[T_2]} \quad (g)$$

$$\frac{\text{Sum of (L)}}{\text{Diff of (Sp)}}$$

Length of Two Trains = 100m, 350m

Their speeds

= 108 km/h, 54 km/h.

36

↓  
15



if two trains are running in opposite direction  
find time taken to cross each other?

$$\frac{100 + 350}{30 + 15} = 10 \text{ sec}$$

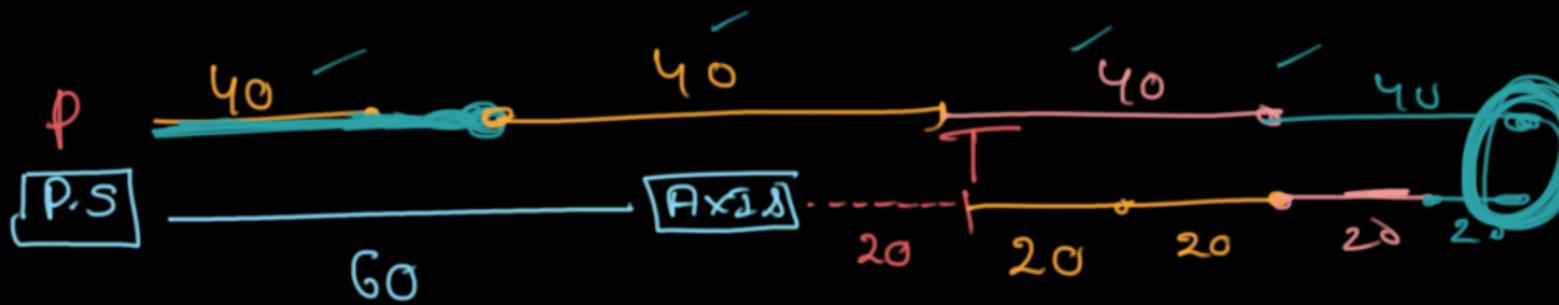
if two trains running in same direction  
find time taken to cross the slowest  
train?

$$\frac{100 + 350}{30 - 15} = \frac{450}{15} = 30 \text{ sec}$$

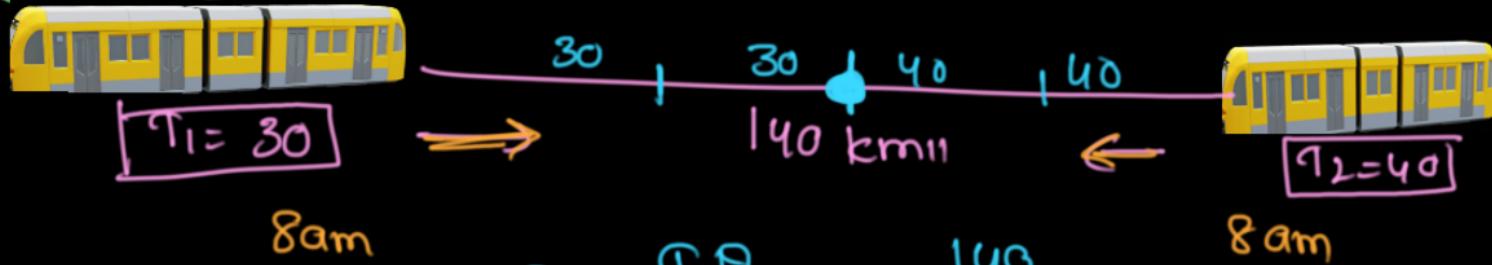


$$\boxed{\text{Time} = \frac{Q \cdot D}{R \cdot S}} = \frac{60 + 20}{40 - 20} = \frac{80}{20} = \boxed{4 \text{ hrs}}$$

A green arrow points from the bottom-left towards the formula  $\text{Time} = \frac{Q \cdot D}{R \cdot S}$ .



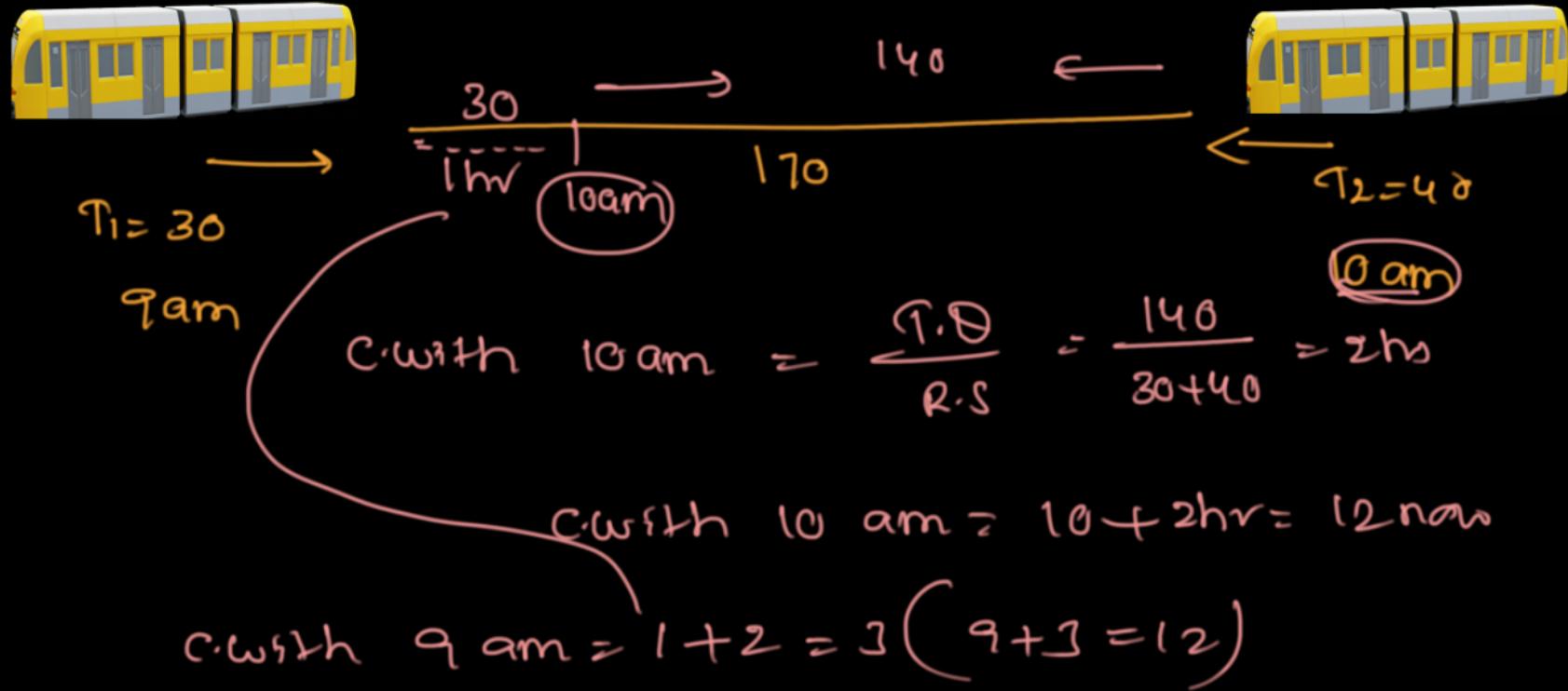
NOTE : 2 :- Same



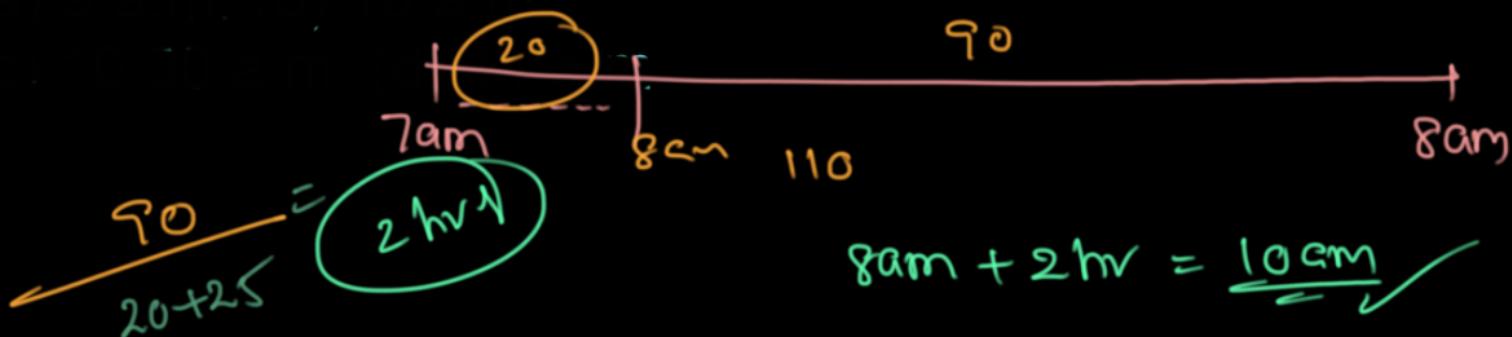
$$T = \frac{R-S}{R+S} = \frac{140}{30+40} = 2 \text{ hours}$$

$$8 \text{ am} + 2 \text{ hours} = \underline{\underline{10 \text{ am}}}$$

NOTE 1] :



Two stations A and B are 110 km apart on a straight line. One train starts from A at 7 a.m. and travels towards B at 20 kmph. Another train starts from B at 8 a.m. and travels towards A at a speed of 25 kmph. At what time will they meet?



Two trains started at 7AM from the same point.  
The first train travelled ~~north~~ at a speed of 80k/h  
and the second train travelled south at a speed of  
100km/h. The time at which they were 540km apart  
is \_\_\_\_\_ AM

$$1\text{hr}v = 100 + 80$$

$$1\text{hr}v = 180\text{km}$$
$$\cancel{?} \cancel{=} 540\text{km}$$

3hrs

$$7\text{am} + 3\text{hrs} = \underline{\underline{10\text{am}}}$$

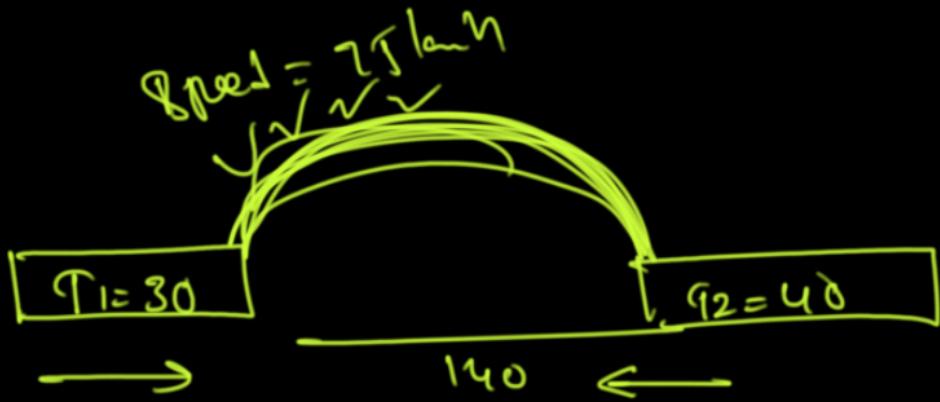


NOTE:- Bird flying concept:-

**NOTE:**



**Remember:** trains meeting time is equal  
to the bird flying time



Bird flying Time = Train Meeting Time

$$\Rightarrow \frac{140}{30+40} = \underline{\underline{2\text{ hr}}} \checkmark$$

$$\begin{aligned}
 \text{Dist} &= \text{Speed} \times \text{Time} \\
 &= 75 \times 2 \text{ hr} = 150 \text{ km} \checkmark
 \end{aligned}$$

Solut& :-

the product of consecutive two even numbers is 224  
find the numbers ?

$$\begin{array}{r} 224 \\ \underline{-1+} \\ 225 \\ \downarrow \\ 15 \\ \swarrow \quad \searrow \\ 14 \quad 16 \end{array} \quad \left. \begin{array}{c} 48 \\ \underline{-1+} \\ 49 \\ \downarrow \\ 7 \\ \swarrow \quad \searrow \\ 6 \quad 8 \end{array} \right\}$$

Product of consecutive 2-odd numbers in 575. Find the numbers.

$$\begin{array}{r} 575 \\ 14 \\ \hline 576 \\ \downarrow \\ 24 \\ \swarrow \quad \searrow \\ 23 \quad 25 \end{array}$$

$$\overbrace{\sqrt{a \cdot \sqrt{a \cdot \sqrt{a \cdots}}}}^n = a$$

$$\overbrace{\sqrt{a \cdot \sqrt{a \cdot \sqrt{a \cdots}}}}^n \text{ times} = a^{1 - \frac{1}{2^n}}$$

$$\overbrace{\sqrt{a + \sqrt{a + \sqrt{a + \cdots}}}}^n = \frac{1 + \sqrt{1 + 4a}}{2}$$

$$\overbrace{\sqrt{a - \sqrt{a - \sqrt{a - \cdots}}}}^n = \frac{-1 + \sqrt{1 + 4a}}{2}$$

$$\left| \begin{array}{l} \frac{\sqrt{a+\sqrt{b}}}{\sqrt{a-\sqrt{b}}} + \frac{\sqrt{a-\sqrt{b}}}{\sqrt{a+\sqrt{b}}} = \frac{2(a+b)}{a-b} \\ \\ \end{array} \right.$$

$$\left| \begin{array}{l} \frac{\sqrt{a+\sqrt{b}}}{\sqrt{a-\sqrt{b}}} - \frac{\sqrt{a-\sqrt{b}}}{\sqrt{a+\sqrt{b}}} = \frac{4\sqrt{ab}}{a-b} \\ \\ \end{array} \right.$$

$$\sqrt{5 \cdot \sqrt{5 \cdot \sqrt{5 \cdots}}} = 5\sqrt{ }$$

$$\sqrt{7 \cdot \sqrt{7 \cdot \sqrt{7}}} = 7^{\frac{7}{8}}$$

$$\sqrt{11 \cdot \sqrt{11 \cdot \sqrt{11 \cdot \sqrt{11}}}} = 11^{\frac{15}{16}}$$

$$\sqrt{12 + \sqrt{12 + \sqrt{12 + \cdots}}} = 2$$

3 (4)

$$\sqrt{20 + \sqrt{20 + \sqrt{20 + \cdots}}} = 2$$

4 (5)

$$\sqrt{30 + \sqrt{30 + \sqrt{30 + \cdots}}} = 2$$

5 (6)

$$\sqrt{12 - \sqrt{12 - \sqrt{12 - \cdots}}} = 2$$

3 (4)

$$\sqrt{6 - \sqrt{6 - \sqrt{6 - \cdots}}} = 2$$

2 (3)

$$\frac{\sqrt{10} + \sqrt{8}}{\sqrt{10} - \sqrt{8}} + \frac{\sqrt{10} - \sqrt{8}}{\sqrt{10} + \sqrt{8}}$$

$$= \frac{2[10+8]}{10-8}$$

Primes :- [3-times] :-

$\Rightarrow$

$\Rightarrow$  Prime number having 2-factors ✓



$\Rightarrow [\text{Prime num}]^2 - \text{having 3 factors}$



GATE:-

How many numbers having 3-factors from 1 to 100.

we need no of factors = 3

i.e.  $(P \cdot N)^2$

$$(P \cdot N)^2 \leq N$$

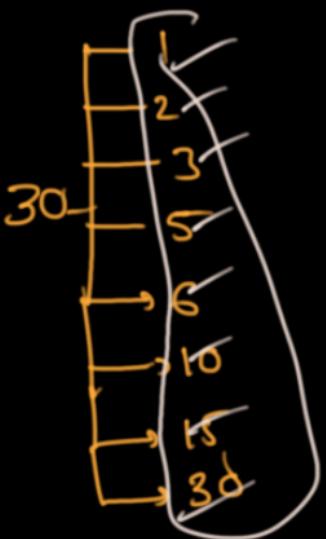
$$\boxed{(P \cdot N)^2 \leq 100}$$

2, 3, 5, 7, - 4 values

④ no of factors : [1 time]

$\Rightarrow \underline{\underline{30}}$

no of factors = 8  
 $\underline{\underline{3}}$



Given question written as product of primes

$$\begin{array}{c} 30 \\ \rightarrow 5 \times 6 \\ \quad | \quad | \\ \quad 5 \times 2 \times 3 \end{array}$$

Diagram showing the prime factorization of 30. A bracket groups 5 and 6, with an arrow pointing to 5. Another bracket groups 6 and 3, with an arrow pointing to 3. A curly brace encloses the factors 2 and 3, with an arrow pointing to 2.

$2+2+2$  (8)

GIVEN QUESTION WRITTEN AS PRODUCT OF PRIMES

$$\Rightarrow a^p \times b^q \times c^r \dots$$

$a, b, c \rightarrow$  primes

$p, q, r \rightarrow$  powers

$$\boxed{\text{then no of factors} = (p+1)(q+1)(r+1) \dots}$$

$$\begin{array}{r} 20 \\ \times 5 \\ \hline 100 \end{array}$$

$$= \textcircled{6}$$

Find the number divisors of 1420.

- (a) 14 (b) 15 (c) 13 (d) 12

~~1420~~

$$142 \times 10$$

$$71 \times 2 \times 5 \times 2$$

$$71^1 \times 5^1 \times 2^3$$

letter [ 11 Times] ✓



Series

3, 6, 9, 12, 15, 18, 21  
C, F, I, L, O, R, U

B, C, E, G, K, M  
2 3 5 7 11 13

Analogy

B : 8 :: K : 1331  
2      11

4 : 4 :: T : 10  
1      1

Odd Man out

11, 13, 15, 17, 23  
K, M, O, S, Q, W

I729, B8, D16, E125

ન્યુ  
પેટ:-

1 2 3 4 5 6 7 8 9 10 11 12 13  
A B C D E F G H I J K L M

N O P Q R S T U V W X Y Z  
14 15 16 17 18 19 20 21 22 23 24 25 26

A-Z  
Z-A

A B C --- X Y Z  
Z Y X --- C, B, A

A - Z [A-Zar]

B - Y [B-oy]

C - X [climax]

D - W [D-wry]

E - V [EVe]

F - U [FAT-U]

G - T [GATE]

H - S [Hyd-sec]

I - R [Ind-R'ly]

J - Q [J-Queen]

K - P [Kap'il]

L - O [LO]

M - N (MAN)

~~A~~  
~~N~~ — ~~m~~  
m — ~~s~~  
 A-G-I-O-U  
 u-u-b-b

~~A - 1~~  
~~E - 5~~  
~~I - 9~~  
~~O - 15~~  
~~U - 21~~

$H = \Theta$	$m = 13$
$N = 14$	$w = 23$
$V = 22$	$T = 20$
	$R, S = 18, 19$
	$G = 7$

$\underline{g = g = g = g = g = g}$

21. ✓ 7G, ✓ 11K, ✓ 13M, 17Q (GATE - 14)  
(a) 15Q      (b) 17Q      (c) 15P      (d) 17P

22. ✓ 13M, ✓ 17Q, ✓ 19S, 23W (GATE - 14)  
(a) 21W      (b) 21V  
**(c) 23W**      (d) 23V

A, B, D, H, P, F

32 < 26  
6

B, C, E, H, L, Q

2    3    5    8    12    17

y, x, v, s, o, T, θ

25    24    22    19    15    10    4

-1    -2    -3    -4    -5    -6

1 AC, FH, KM, PR  
 3 6 8 11 13 16  
 BD, FH, JL, NP, RF  
 2 6 10 14  
 By, DW, FU, HS, JP  
 1 4 6 8 10

✓ S, M, T, W, T, F, Sat  
 J, F, M, A, M, J, J, A, S, O  
 O, T, T, F, F, S, S, E, N  
 one |  
 Two  
 Nine

Bale  
on Colonies

05. ~~T/J : 2 :: X/H : ?~~  
~~24/8 = ①~~

- (a) 2  
(c) 23/7

- (b) 3  
(d) 4a

06. ~~MO:1312 :: HJ: ?~~  
~~8 17~~  
~~OPP opp o'se~~  
~~opp o'se betw two numbers~~

- (a) 810  
(c) 812  
(b) 817  
(d) 816

L ↗ O  
12

07. ~~ACEG : IKMO :: QSUW ?~~

- (a) YZCE  
(c) YACE

- ~~171921~~  
~~→ 8 25~~  
(b) YACD  
(d) YBCE

08. ~~FILM: ADGH: : MILK : ?~~  
~~6 13 9 11 HD~~

- ~~2 9 4~~  
(a) ADGF  
(c) HDGF  
(b) HDGE  
(d) HEGE

08. Find the odd one from the following group

(GATE - 14)

WEKO  
8, 6, 4

IQWA  
8, 6, 4

FNTX  
6, 14, 20, 24

NVBD  
14, 22, 28

- (a) WEKO  
(c) FNTX

- (b) IQWA  
(d) NVBD

20. AD, CG, FK, JP, (GATE - 12)  
(a) PV      (b) PW      (c) OV      (d) OW
- 
- 1 3 6 10 15 22 v

23. A, CD, GHI, mncp, UVWXYZ (GATE - 15)
- (a) LMN      (b) MNO  
(c) ~~MNOP~~      (d) NOPQ

726

$$2 \times 363$$

$$2 \times 3 \times 121$$

2 3 111

1