

## Foundation Numerical Ability — 20 Q's

$$100\% = 1$$

SI & CI

Q1. A sum of Rs 30000 is invested in a scheme where the interest gets compounded annually and grows to Rs 51840 in three years. How much interest (in Rs) would have got accrued in six months in the same scheme had the interest been compounded quarterly?

A) 3075

B) 2975

C) 3024

D) 3126

$$\begin{aligned}
 R &= 20\% - 1 \text{ year} \\
 &\downarrow \quad \quad \quad \downarrow \div 4 \\
 &5\% - \text{Quarterly}
 \end{aligned}$$

~~30000~~  
~~1000~~

$$\begin{aligned}
 (100\% + R\%)^3 &= \frac{1728}{51840} \\
 1 + \frac{R}{100} &= \frac{12}{10} \\
 R &= 20\%
 \end{aligned}$$

$$[105\% = 1.05]$$

$$CI = 30000 (105\%)^2 - 30000 = 3075$$

$$30000 \Rightarrow \left\{ \begin{array}{l} CF_{Q1} = 5\% \cdot (30000) = 1500 \\ CF_{Q2} = 1500 + 75 = 1575 \end{array} \right.$$

"Assume"  $CP_1 = 100, CP_2 = 100 \Rightarrow CP = 200$

Q2. After purchasing two copies of the same book, X sold them respectively at 0.8 and 1.4 times their cost prices. What was the percentage gain earned or loss incurred by X?

- A) 10% loss
- B) 5% gain
- C) 10% gain
- D) 5% loss

$\checkmark$   $CP \rightarrow SP$

$$SP_1 = 0.8 \times 100 = 80$$

$$SP_2 = 1.4 \times 100 = 140$$

$$\Rightarrow SP = 220$$

$$P = \frac{20}{200} \times 100\% = 10\% \text{ profit}$$

$0.8 + 1.4 = 1.1 = 110\%$

$\frac{1}{2} \times 100\%$

Q3. An item was sold at a profit of 12% after giving a discount of 12.5% on the list price.

What would be the gain or loss percentage if a discount of 25% is given on the list price?

A) 2.5% gain

B) 2.5% loss

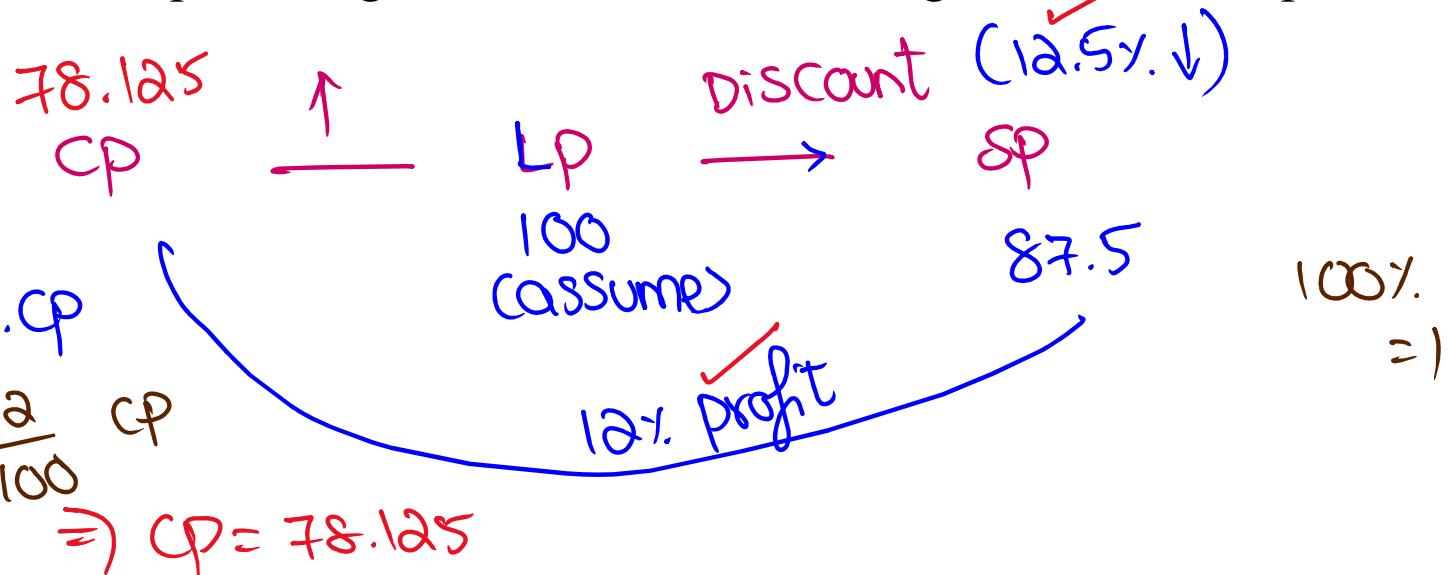
C) 4% loss

D) 4% gain

$$SP = 112\% \cdot CP$$

$$87.5 = \frac{112}{100} CP$$

$$\Rightarrow CP = 78.125$$



CP

78.125

LP

100

25% ↓

SP

75

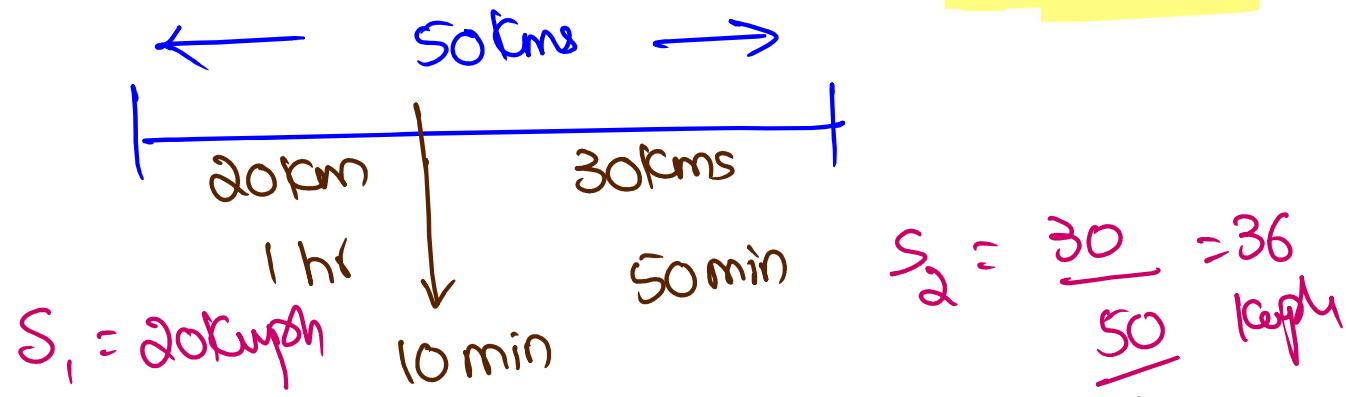
$$\text{LOSS \%} = \frac{3.125}{78.125} \times 100\% = 4\%$$

$$\text{LOSS} = 3.125$$

Q4. A man has to travel 50 km in 2 hours. He could cover 20 km in one hour, and then had to stop for 10 minutes for refueling. By what factor should he increase his speed with reference to that during the first hour so as to be able to complete the journey as per schedule?

- A) 1.5
- ~~B) 1.8~~
- C) 1.2
- D) 2.4

$$\boxed{\frac{36}{20} = 1.8}$$



## Divisibility

$n$  is digit  $\Rightarrow (0-9)$

Q5. If  $n$  is an integer such that  $1nn352$  is a six-digit number exactly divided by 24, what will be the "sum of the possible value of  $n$ ?"

A) 21

B) 27

C) 9

~~D) 15~~

$\div 8 \rightarrow$  Last 3 digits ✓

$\div 3 \rightarrow$  Sum of digits

$$1 + 2n + 10 \Rightarrow 2n + 11$$

$(0-9)$  digit  $\leftarrow n=2, 5, 8$

$$24 = 2^3 \times 3^1$$

$$\div 8 \quad \div 3$$

↓

$$\div 24$$

$$r = 15$$

Q6. The diameter of a pizza is 30 cm. What is the area (in  $\text{cm}^2$ ) of the upper surface of a sector of the pizza whose arc length is 8 cm?

- A) 120
- B)  $120\pi$
- C)  $60\pi$
- D) 60



$$\text{Area} = \frac{\pi r^2}{360^\circ} \theta$$

$$\frac{\pi (15^2)}{360^\circ} \theta = 8$$

$$\frac{225\pi}{360} \theta = 8$$

$$\frac{5\pi}{72} \theta = 8$$

$$\theta = \frac{8 \times 72}{5\pi}$$

$$\theta = \frac{1152}{5\pi}$$

$$\theta = \frac{230.4}{\pi}$$

$$\theta = 73.6^\circ$$

$$\boxed{\text{Area} = 60 - 8}$$

Q7. What is the mean deviation of the data 8, 9, 12, 15, 16, 20, 24, 30, 32, 34?

- A) 10.2

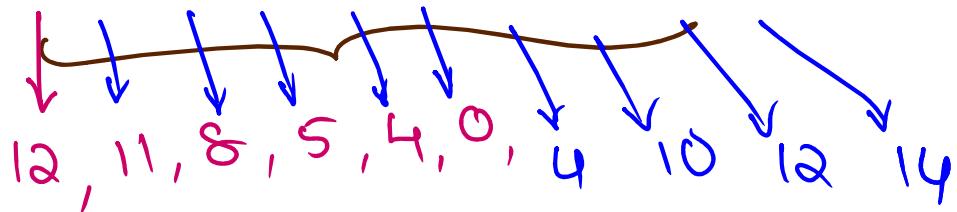
- B) 8

- C) 0

- D) 5

$$\mu = \bar{x} = 20$$

$$\text{deviation} |(x - \bar{x})|$$



$$MD = \frac{80}{10} = 8$$

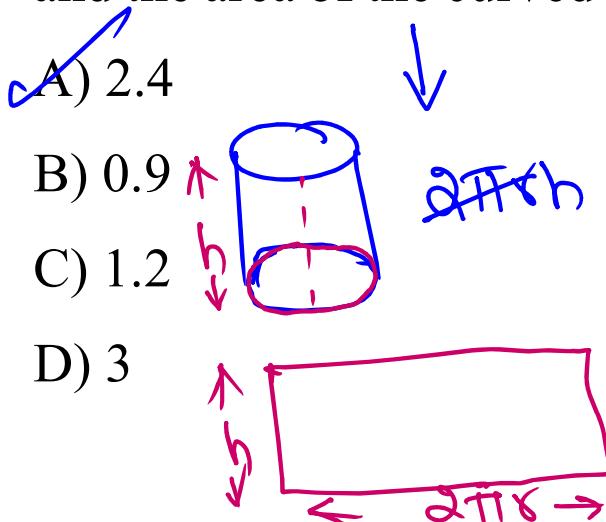
Q8. What is the diameter (in cm) of a solid right circular cylinder whose height is 6 cm and the area of the curved surface is five times the combined area of the two flat surfaces

A) 2.4

B) 0.9

C) 1.2

D) 3



$$2\pi \quad h=6$$

$$= 5 \times$$

$$2\pi r^2$$

$$r = 6/5 = 1.2 \Rightarrow 2r = 0.4$$

Q9. What is the sum (in Rs.) which when divided among X, Y & Z in the proportion 3: 5: 7 provides rupees 8000 more to Z than what it would have done to him when the proportion is 11: 15: 19?

- ~~A) 180000~~
- B) 120000
- C) 175000
- D) 135000

$$z - z' = 8000$$

$$7k - 10q = 8000$$

$$\Rightarrow q = 4000$$

$$x:y:z = \underbrace{3:5:7}_{\begin{array}{c} 3k \\ 5k \\ 7k \end{array}} \quad | \quad 15$$

$$18k = A = \underbrace{45q}_{3} \Rightarrow k = 3q$$

$$x':y':z' = \underbrace{11:15:19}_{\begin{array}{c} 11q \\ 15q \\ 10q \end{array}} \quad | \quad 45$$

$$\text{Amount} = A = 45q = 15k$$

$$= 180000$$

Q10. The collection of numbers which comprise the data given below is arranged in ascending order.

$$(3, 7, 9, \underbrace{N - 1}_{\text{median}}, 15, 18, 19, 20)$$

If the median of the data is 12.5, what is the value of N?

- A) 10.5
- B) 11.5
- C) 11
- D) 12

$$\frac{(N-1) + 15}{2} = 12.5$$
$$\Rightarrow N-1 = 10$$
$$\Rightarrow N = 11$$

statistics

ungrouped data

Median

① order

② Middle term

$SI$       Amount<sub>7</sub>      Amount<sub>9</sub>

Q11. A sum invested on simple interest grows to Rs 22500/- and Rs 25500/- is seven and nine years respectively. What is the rate percentage of the interest?

- A) 7.5
- B) 9.6
- C) 12.5
- D) 13.5

$$\text{Amount} = P + \text{Interest}$$

↓

$x$  - Interest for 1 year

$$22500 = P + 7x$$

$$\left\{ \begin{array}{l} 22500 = P + 7x \\ 25500 = P + 9x \end{array} \right. \Rightarrow \begin{aligned} 2x &= 3000 \\ x &= 1500 \end{aligned}$$

$$\left| \begin{array}{l} P = 12000 \\ I = \frac{P \cdot T \cdot R}{100} \\ 1500 = \frac{12000 \times 1 \times R}{100} \end{array} \right. \Rightarrow \begin{aligned} 1500 &= \frac{12000 \times 1 \times R}{100} \\ 1500 &= 120R \\ R &= 12.5 \end{aligned}$$

## Time & Work

Q12. X is four times as efficient as Y in respect of doing a particular work. Working together they complete the work in 16 days. In how many days Y working alone will be able to half the work?

- A) 80
- B) 20
- C) 40
- D) 60

full work

$$\begin{array}{l} X \\ Y - \frac{16 \times 5}{xS} = 80 \text{ days} \\ (X+Y) - 16 \text{ days} \end{array}$$

4 P/d      1 P/d      4+1=5 P/d

$\uparrow \div 5$

Eff.

Q13. 96 men were engaged for a project of constructing a railway track of the length of 18 km in four weeks. After one week it was observed that the work of 4 km was completed. How many additional men should be engaged for timely completion of the

project?

A) 16

B) 14

C) 15

D) 12

"chain Rule"

$$\frac{M_1 T_1}{W_1} = \frac{M_2 T_2}{W_2}$$

$$18\text{km} - 4 \text{ weeks}$$

$$96 \text{ N}, 4\text{km}, 1 \text{ week}$$

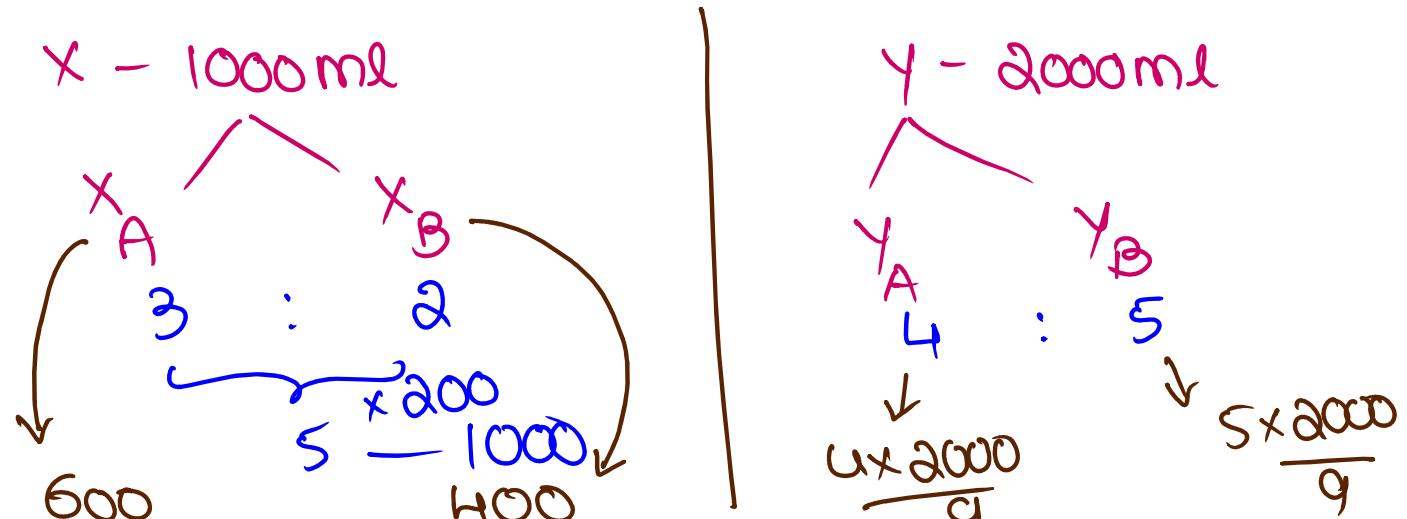
$$8 \cancel{24} \frac{96 \times 1}{4}$$

$$96 + A, 14\text{km}, 3 \text{ weeks}$$

$$(96 + A) \times 3 = \frac{112}{14} \Rightarrow 112 = 96 + A$$

Q14. Two vessels X and Y of capacities one and two litres respectively are completely filled with mixtures of two chemicals A and B. The ratio by volume of the chemicals A and B in X and Y are 3:2 and 4:5 respectively. The contents of A and B are mixed and the combination is kept in a vessel C of capacity of four litres. How many litres of Chemical A should be added to the combination so as to make the ratio of A to B equal to 1:1?

- A)  $\frac{1}{270}$       B)  $\frac{1}{67}$   
 C)  $\frac{1}{68}$       D)  $\frac{1}{135}$



$$x, y \rightarrow c = 4 \text{ lit}$$

$$\frac{1}{1} \Leftrightarrow \frac{c_A}{c_B} = \frac{600 + \frac{8000}{9}}{\frac{4000}{9} + 1000} = \frac{134}{136} = \frac{67}{68}$$

Q15. What is the value of  $(0.0000128)^{\frac{1}{7}}$ ?

- A) 0.5
- B) 5
- C) 0.2
- D) 2

$$\left(128 \times 10^{-7}\right)^{\frac{1}{7}} = \left(\left(\frac{2}{10}\right)^7\right)^{\frac{1}{7}} = 0.2$$

Q16. The mean of a set of data is 5. What will be the mean if ten is subtracted from each data?

- A) -5
- B) 5
- C) 10
- D) -15

If each data is  $+/- |x| \div k$  then  
average is also  $+/- |x| \div k$

$$\begin{array}{ccc} 4, & 6 & \Rightarrow \bar{x} = 5 \\ \downarrow & \downarrow -10 & \\ -6, & -4 & \Rightarrow (\bar{x})' = -5 \end{array}$$

Q17. The value of  $2 + \frac{1}{3 + \frac{1}{4 + \frac{3}{2}}} \text{ of } \frac{7}{11} + \left(1\frac{1}{2} + 2\frac{1}{5}\right) \div 7\frac{2}{5}$  is:

~~A)  $3\frac{4}{9}$~~

~~B)  $4\frac{7}{9}$~~

~~C)  $4\frac{3}{5}$~~

~~D)  $2\frac{7}{10}$~~

$$3 + \frac{\frac{1}{2}}{\frac{9}{11}} = \frac{11}{35} \quad \frac{1}{2}$$

$$2 + \frac{1}{5\frac{38}{35}} \times \frac{1}{7} + \frac{1}{2} = 2 + \frac{1}{10} = 2\frac{1}{10}$$

$$\frac{1}{2\frac{7}{10}} \div \frac{1}{7\frac{2}{5}}$$

$$\frac{1}{2\frac{7}{10}} \quad \frac{1}{7\frac{2}{5}}$$

## "Proportion"

Q18. What is the mean proportional between the fourth proportional of (6, 9, 16) and (7, 9, 42)?

A) 48

~~B) 54~~

a, b, c and d are in proportion

~~C) 36~~

~~D) 24~~

$$\Rightarrow \frac{a}{b} = \frac{c}{d}$$

$$6, 9, 16, \underline{24}$$

proportion

$$\frac{2}{3} \frac{6}{9} = \frac{16}{?}$$

$$7, 9, 42, \underline{54}$$

$$\frac{7}{9} = \frac{42}{?}$$

Mean  
↑ Propo-  
q - ratio

3rd proportion P, q, r are in proportion  $\Rightarrow \frac{P}{q} = \frac{q}{r}$

$$24, \underline{36}, 54$$

$$\frac{24}{x} = \frac{x}{54} \Rightarrow x = \sqrt{8 \times 3 \times 9 \times 6} \\ = 4 \times 3 \times 3 = \underline{\underline{36}}$$

Q19. If  $0.0025\% \text{ of } 0.06\% \text{ of } 16000 = 0.006\% \text{ of } x$ , then what is the value of  $x$ ?

- A) 0.04
- B) 4
- C) 0.4
- D) 0.004

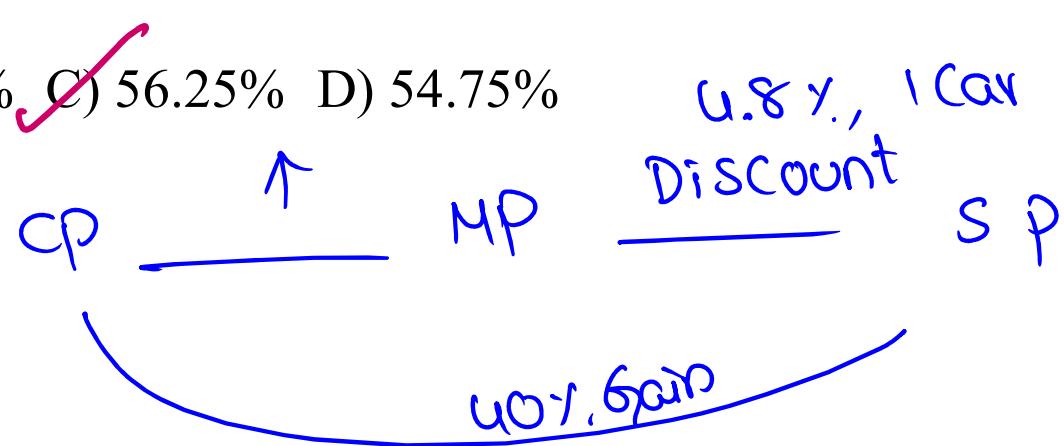
$$\frac{1}{16000} \times \frac{6}{100} \times \frac{16000}{100} = \frac{6}{1000} \times x$$

~~$\frac{1}{16000}$~~   ~~$\frac{6}{100}$~~   ~~$\frac{16000}{100}$~~   ~~$\frac{6}{1000}$~~   ~~$x$~~

~~$x$~~

Q20. Priya offers 4.8% discount on the marked price of a toy car and gives 1 toy car free on buying all 16 toy cars and thus gains 40%. The marked price of the toy car is above the cost price by:

- A) 54.25%
- B) 55.25%
- C) 56.25%
- D) 54.75%



$$16 \times 95.2\% \text{ MP} = 140 \times 17 \text{ CP}$$

$\underbrace{\hspace{10em}}_{\text{SP}}$

$$\text{MP} = \frac{140 \times 17}{16 \times 95.2} \text{ CP} = 1.5625 \text{ CP}$$

$\cancel{\text{CP}}$

$16 \text{ MP} \times 95.2\% = 17 \text{ CP} \times 140\%$

$\underbrace{\hspace{10em}}_{\text{GP}}$

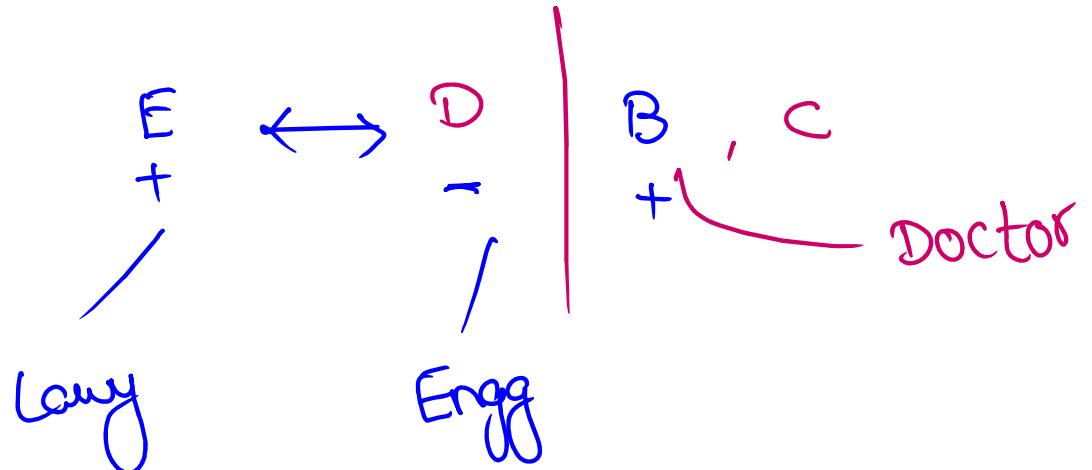
$$\text{MP} = 156.25\% \text{ GP}$$

## Foundation Reasoning Ability — 20Q's

Q1. There are five persons in a family A, B, C, D and E. In which, one is working as a doctor; one is an engineer. Both A and C are unmarried ladies, who are not working. None of the ladies is working as a doctor and a lawyer in the family. E is the husband of the only one married couple in the family. B is the brother of C and neither a lawyer and nor an engineer.

Who is the lawyer?

- A) E
- B) D
- C) A
- D) B



## Blood Relations

Q2. In a certain code,  $a+b$  means a is the wife of b;  $a*b$  means a is the brother of b and  $a/b$  means a is the son of b.

If  $T/Z * U+W$ , then which of the following is true?

- A) U is the aunt of T
- B) W is the wife of Z
- C) T is the daughter of Z
- D) U is the uncle of T

$$\begin{matrix} Z & , & U & \longleftrightarrow & W \\ + & & - & & + \\ \downarrow & & & & \\ T & & & & + \end{matrix}$$

Q3. A statement is followed by two assumptions numbered I and II. Consider the statement and decide which of the given assumption(s) is/are implicit in the statement.

Statement-

Various governments across the world have issued strict guidelines for the public to wear masks and wash hands regularly to safeguard their health during covid-19 pandemic.

Assumptions-

I. Covid-19 Pandemic is a serious health issue ✓

II. There are ways by which people can save themselves from Covid-19 pandemic ✓

A) Neither I nor II is implicit

B) Both I and II are implicit ✓

C) Only II is implicit

D) Only I is implicit

Q4. There are five persons in a family A, B, C, D and E. In which, one is working as a doctor; one is an engineer. Both A and C are unmarried ladies, who are not working. None of the ladies is working as a doctor and a lawyer in the family. E is the husband of the only one married couple in the family. B is the brother of C and neither a lawyer nor an engineer.

Who is the doctor in the family?

- A) A
- B) E
- C) B
- D) D

Q5. In a certain code,  $K^*N$  means K is the brother of N,  $K+N$  means K is the husband of N,  $K \times N$  means K is the mother of N and  $K \div N$  means K is the sister of N, then which of the following expressions means C is the daughter of Y?

~~A)  $Y+R \times C^*H \div V$~~

C - male

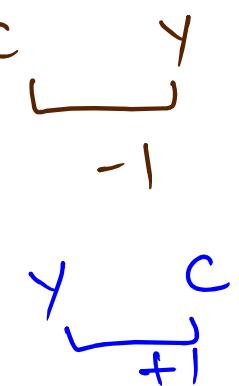
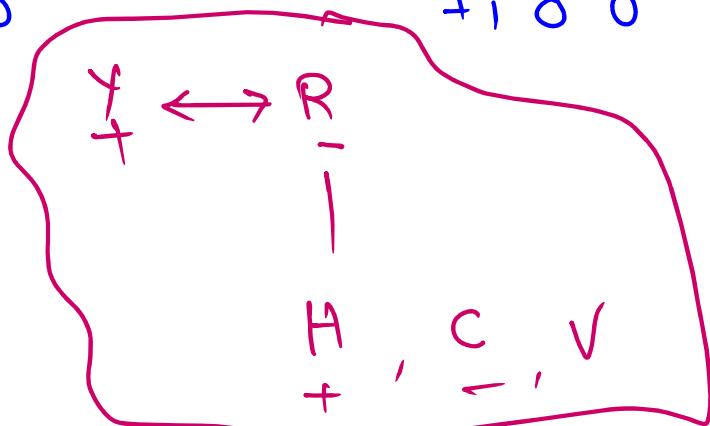
~~C)  $Y+R \times H^*C \div V$~~

~~B)  $Y+R \times H \div C^*V$~~

C - male

~~D)  $Y \times R + H^*C \div V$~~

C - female



Q6. Three Statements are followed by four conclusions numbered I, II, III and IV. Assuming the statement to be true. Even if they do not confirm to real world knowledge, decide which of the conclusion(s), logically follows from the statements.

Statement:

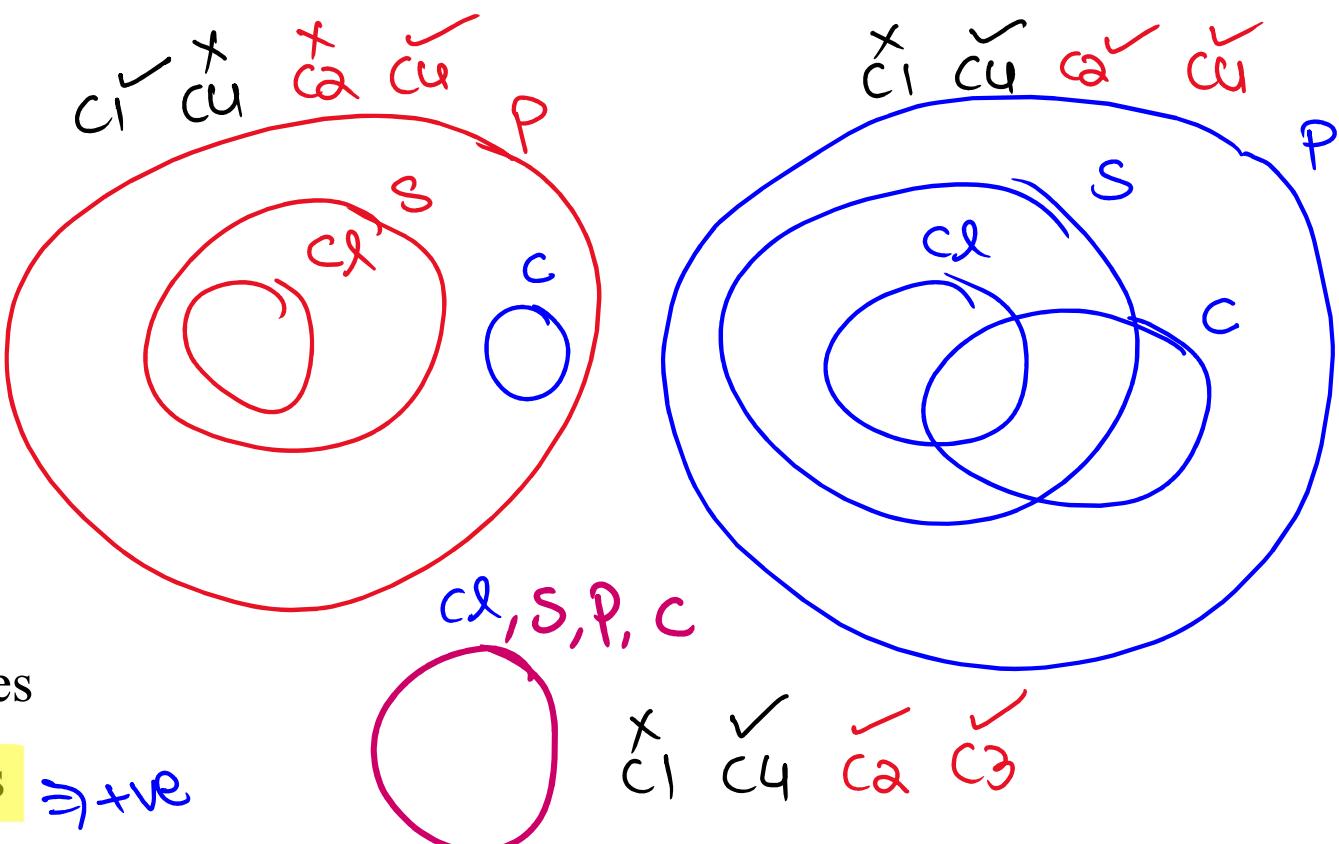
1. All clothes are Shirts
2. All shirts are pants.
3. All cots are pants.

~~All  $\rightarrow$  Some~~  
~~definitely~~  
Conclusion:

1. No cloth is cot  $\Rightarrow$  -ve
2. Some cots are shirts.
3. Some pants are clothes
4. Some clothes are cots  $\Rightarrow$  +ve

- ~~A) Only Either I or IV and III follow~~
- ~~B) Only III follow~~

$I \checkmark \cancel{IV}, \cancel{IV} \checkmark I$



C) Only II follow

D) Only I follow.

Q7. In a certain code A%B means A is the brother of B, A&B means A is the mother of B, A@B means A is the daughter of B, A\$B means A is the father of B, A#B means A is the sister of B.

"Legal Relations"

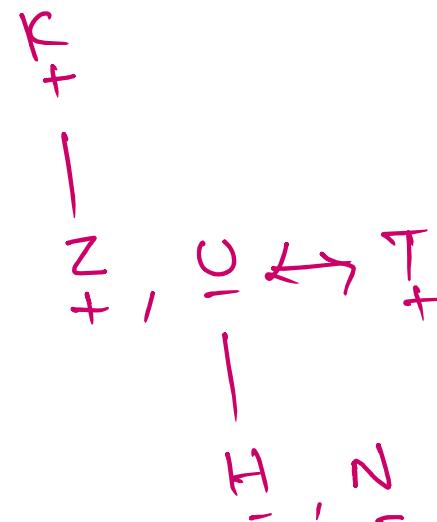
If K \$ Z % U & H # N @ T, how T is related to U?

A) Sister

B) Brother

C) Husband ✓

D) Wife



Q8. Five Friends A, B, C, D, E are sitting in a line facing North. Who is sitting exactly in the middle?

S<sub>1</sub> ✗

E    D    A    C    B ✓

I. C is sitting between A and B. E is at the fourth place to the left of B.

E    A    C    D    B

II. E is sitting to the immediate left of D. C is to the immediate left of B.

A) Statement II alone is sufficient.

S<sub>2</sub> ✗      CB  
ED |

EDCBA

B) The combination of both statements I and II are not sufficient.

CBEDA

C) The combination of both statements I and II are necessary.

CB A ED

D) Statement I alone is sufficient.

(S<sub>1</sub>+S<sub>2</sub>)    ⇒    EDACB

EDBAC

Q9. A statement is followed by two assumptions number I and II. Consider the statement and decide which of the given assumptions(S) is/are Implicit in the statement.

Statement: If he is a hard worker, he will succeed in Life.

Assumptions:

I. To succeed, he **must** be a hard worker ✗

II. He will succeed in life ✗

A) None of I and II are implicit.

B) Only I is implicit.

C) Only II is implicit.

D) Both I and II are implicit.

then only  $\Rightarrow$  I ✓

✓ III. Ram is hard worker. Ram  
Succeed  
in life.

Q10. Which is the wrong term in the following series?

axc, cve, fsh, jpm, oyq, udw

A) udw

B) ojq

C) jpm

D) fsh

a, c, f, j, o, u  
1    3    6    10    15    21  
      |    |    |    |    |  
      2    3    4    5    6  
  
e, g, i, m, l, a, o, w  
3    5    8    13    17    23  
      |    |    |    |  
      2    3    4    5    6

Q11. Given below is a question by two statements, I and II each containing some information. Decide which of the statement (s) is/are sufficient to answer the question.

Among Six people P, Q, R, S, T and U, how many are teachers?

Statement:

$S_1 \checkmark$        $S_2 \times$

I. "Q and T are teachers" is True.

II. "At least one of P and R is a teacher" is false and S and U's status is same like P and R.

$\underbrace{P, R \text{ are not teachers}}_{S_1 + S_2 \Rightarrow P \leftarrow Q \leftarrow R \leftarrow S \leftarrow T \leftarrow U} \Rightarrow P \leftarrow Q \leftarrow R \leftarrow S \leftarrow T \leftarrow U$

A) Statement II alone is sufficient.

B) Both the statement I and II together are needed.

C) Both the statement I and II together are not sufficient.

D) Statement I alone is sufficient.

Q12. Given below is a question followed by two statements. I and II, each containing some information. Decide which of the statements are sufficient to answer?

How many Rs would Shalini need to spend to buy 11 pencils and 14 pens?

- I. Shalini spent an amount of Rs 201 to buy 15 pencils and 12 pens
- II. Shalini spent an amount of Rs 121 to buy 7 pencils and 9 pens

- A) Statement II alone is sufficient
- ~~B) The combination of both statements I and II are necessary~~
- C) The combination of both the statements are not sufficient
- D) Statement I alone is sufficient

$$11Pl + 14P = ?$$

$$\begin{array}{l} S1 \quad [10Pl + 20P = 250] \\ S2 \quad [4Pl + 8P = 100] \end{array}$$

Together not sufficient

$$10Pl + 15P ?$$

$\checkmark \quad S1 \Rightarrow 20Pl + 30P = 150$

$S2 \Rightarrow 15Pl + 10P = 90$

S1 alone

Q13. Nehal, Iqbal, Ronit, Malini, and Harbajan, in any one of the 5 activities, i.e., quiz, singing, dance, debate, and mimicry. Ronit participates in singing, Harbajan does not participate in debate or mimicry, Malini does not participate in Mimicry. Iqbal participates in Quiz. Who participates in the debate?

- A) Nehal or Malini
- B) Cannot be determined
- C) Malini
- D) Nehal

Q14. Given below is a question followed by two statements, I and II, each containing some information. Decide which of the statement(s) is/ are sufficient to answer the question.

How is A related to C?

Statements:

a. A is the wife of B and B is the brother of C.

b. C is the son of D

A) Statement I alone is sufficient.

B) Statement II is sufficient.

C) Both I and II together are sufficient

D) Both I and II together are not sufficient.

S<sub>I</sub> ✓

A  $\leftrightarrow$  B, C

How is C related to A?

Together sufficient

Q15. Choose the best option.

Statement: Air quality has been polluted due to the increasing number of two-wheelers and four-wheelers.

Courses of action: Immediate action to improve situation  
not create another pblm

Courses of action:

- I. There should be a complete ban on the sale of two-wheelers at least for the next 5 years.
- II. Monitoring should take place to ensure that the vehicle's owners get their vehicles checked and certified for pollution-control.
- III. Four-wheelers cause more pollution, hence four-wheelers alone can be banned from running on the roads.

- A) None of the options follow
- B) Only II follows ✓
- C) Only III follows
- D) Only I follows