

## 6th October Mathematics Mega Quiz (Solutions)

**S1. Ans.(c);**

**Sol.**

$$\begin{array}{ccc}
 \text{I} & & \text{II} \\
 8\% & & 18\% \\
 & \searrow & / \\
 & 14\% & \\
 & / & \searrow \\
 4 & & 6 \\
 2 & & 3 \\
 = 1000 \times \frac{2}{5} \\
 = 400 \text{ kg}
 \end{array}$$

**S2. Ans.(c);**

**Sol.** S.P. 1<sup>st</sup> OX = 8400

$$P\% = 20\% = \frac{1}{5}\%$$

C.P.            S.P.

5                    6

↓×1400            ↓×1400

7000                8400

total S.P. = 16800

total C.P. = 16800

C.P. of 2<sup>nd</sup> OX = 16800 - 7000

= 9800

$$\frac{1400}{9800} \times 100$$

$$= \frac{100}{7} = 14\frac{2}{7}\%$$

**S3. Ans.(b);**

**Sol.** 20% =  $\frac{1}{5}\%$

C.P.            :            M.P.

5                    6

↓×100            ↓×100

500                600

**S4. Ans.(d);****Sol.** C.P. of 24 Bananas = 32 Rs.

S.P. of 24 Bananas = 20 Rs.

$$\text{Loss \%} = \frac{12}{32} \times 100$$

$$= 37.5\%$$

**S5. Ans.(d);****Sol.** C.P. of 100 cups =  $100 \times 10$ 

$$= 1000$$

S.P. of 80 cups =  $80 \times 11$ 

$$= 880$$

$$\text{Loss \%} = \frac{120}{1000} \times 100$$

$$= 12\%$$

**S6. Ans.(a);****Sol.** S.P. of 12 copies – C.P. of 12 copies = C.P. of 3 copies

S.P. of 12 copies = C.P. of 15 copies

1800 = C.P. of 15 copies

$$\text{C.P. of 1 copy} = \frac{1800}{15}$$

$$= 120/-$$

**S7. Ans.(d);**

**Sol.**  $20\% = \frac{1}{5}$

S.P. = 5

C.P. = 6

$$\text{Loss \%} = \frac{1}{6} \times 100$$

$$= \frac{50}{3}\%$$

**S8. Ans.(b);**

**Sol.**  $\frac{63}{12 \times 105} = \frac{247.5}{50 \times (100 \pm a)}$

$$495 = 5 (100 \pm a)$$

$$99 = (100 \pm a)$$

$$a = -1\%$$

$$\text{Loss \%} = 1\%$$

**S9. Ans.(a);**

**Sol.**  $\frac{140}{80 \times 70} = \frac{104}{N \times 130}$

$$\frac{1}{4} = \frac{8}{N}$$

$$N = 32$$

**S10. Ans.(c);****Sol.** Real Price = 100


C.P. = 95

$$\text{S.P.} = 95 \times \frac{120}{100}$$

$$= 114$$

$$\text{Profit \%} = 14\%$$

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**S11. Ans.(b);**

**Sol.**

A 15 4

B 10 60 6

C -12 -5

Efficiency of A + B - C = 5

A, B and C will complete the work in =  $\frac{60}{5} = 12$  days

**S12. Ans.(a);**

**Sol.**

Total work Efficiency

A 10 3

30

B 15 2

A + B will take =  $\frac{30}{5} = 6$  days

**S13. Ans.(d);**

**Sol.**

Total work Efficiency

A 12 5

60

B 15 4

3 days work of A =  $5 \times 3 = 15$

Remaining work =  $60 - 15 = 45$

Time =  $\frac{45}{9} = 5$  days

**S14. Ans.(c);**

**Sol.**

A 8 15

B 10 120 12

C 12 10

2 hour work of A + B + C

=  $2 \times (15 + 12 + 10)$

= 74

Remaining work =  $120 - 74 = 46$

46 work is done by B + C in =  $\frac{46}{22} = \frac{23}{11}$

=  $2\frac{1}{11} = 2$  hour  $\frac{60}{11}$  minutes  $\cong 2$  hours 5 minutes

The work gets completed by 01 : 05

**S15. Ans.(d);**

**Sol.**

12M  $\rightarrow$  18 days

Efficiency of 12M  $\rightarrow \frac{1}{18}$  days

Work done by 12 Men in 6 days =  $\frac{6}{18} = \frac{1}{3}$



**S19. Ans.(a);**

**Sol.**

	Total work	Efficiency
San → 20	60	3
Praveen → 30		-2

2 day's work of S + P = 1  
14 day's work of S + P = 57  
Now it's S's turn  
On 115<sup>th</sup> day wall will be complete = 57 + 3 = 60

**S20. Ans.(b);**

**Sol.**

$A = \frac{130}{100}B$   
Efficiency, A : B = 13 : 10  
Time, A : B = 10 : 13  
10 r → 23 days  
13r →  $\frac{23 \times 13}{10}$  days  
Working together, there efficiency  
 $= \frac{10}{23 \times 13} + \frac{1}{23} = \frac{10+13}{23 \times 13} = \frac{23}{23 \times 13} = \frac{1}{13}$   
They will complete the work in ⇒ 13 days

**S21. Ans.(c);**

**Sol.** Time =  $\frac{180}{10} = 18$  sec.

**S22. Ans.(c);**

**Sol.** A  $\xrightarrow{330 \text{ km}}$  B  
Distance B/w two train at 9 am  
= 330 - 60 = 270 km  
They will meet after =  $\frac{270}{135} = 2$  hours  
They will meet at = 11.00 am

**S23. Ans.(b);**

**Sol.** Time taken =  $\frac{1200}{10} = 120$  minutes

**S24. Ans.(b);**

**Sol.**

$7 \sin^2 \theta + 3 \cos^2 \theta = 4$   
 $7(1 - \cos^2 \theta) + 3 \cos^2 \theta = 4$   
 $\cos^2 \theta = \frac{3}{4}$   
 $\cos \theta = \frac{\sqrt{3}}{2}$   
 $\theta = 30^\circ$   
 $\tan \theta = \frac{1}{\sqrt{3}}$

S25. Ans.(a);

Sol.

$$\sin^2 1^\circ + \sin^2 5^\circ + \sin^2 9^\circ + \dots + \sin^2 89^\circ$$

$$\text{sum} = \frac{\text{number of terms}}{2} \left[ \begin{aligned} &\sin^2 1 + \sin^2 89 \\ &= \sin^2(90 - 89) + \sin^2 89 \\ &= \cos^2 89 + \sin^2 89 \\ &= 1 \end{aligned} \right]$$

$$= \frac{23}{2}$$

$$= 11 \frac{1}{2}$$

S26. Ans.(d);

Sol.

$$\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \dots + \sin^2 85^\circ + \sin^2 90^\circ$$

$$\text{Sum} = \frac{\text{number of terms}}{2} + \sin^2 90^\circ$$

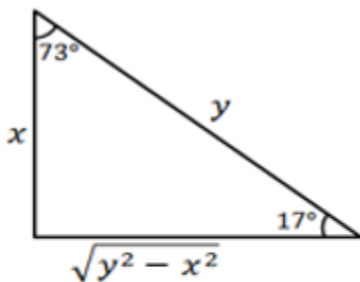
$$= \frac{17}{2} + 1$$

$$= 9 \frac{1}{2}$$

S27. Ans.(b);

Sol.

$$\sin 17^\circ = \frac{x}{y}, \text{ find } (\sec 17^\circ - \sin 73^\circ)$$



$$\begin{aligned} &\frac{y}{\sqrt{y^2 - x^2}} - \frac{\sqrt{y^2 - x^2}}{y} \\ &= \frac{y^2 - (y^2 - x^2)}{y\sqrt{y^2 - x^2}} \\ &= \frac{x^2}{y\sqrt{y^2 - x^2}} \end{aligned}$$

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**S28. Ans.(d);**

**Sol.**

According to the question,

Work completed by Harveen in 6 days

= Work completed by Deepak in 8 days

Time taken by Deepak to complete the work

$$= \frac{8 \times 18}{6}$$

$$= 24 \text{ days}$$

**S29. Ans.(d);**

**Sol.**

A + B → 15 days

Let the efficiency of B = 1

So, efficiency of A = 0.5

According to the question,

$$1.5 \times 15 = 0.5 \times x \text{ days}$$

$$x = 45 \text{ days}$$

**S30. Ans.(b);**

**Sol.**

$$M_1 \times D_1 = M_2 \times D_2$$

$$35 \times 6 = 15 \times x$$

$$x = 14 \text{ days}$$

