

Mathematics Mega Quiz For RRB NTPC (Solutions)

S1. Ans.(a)

Sol.

$$10\% \text{ discount} \rightarrow \frac{1}{10}$$

It means,

On selling 9 kite 1 is free

$$9 \rightarrow 1 \text{ free}$$

$$1 \rightarrow \frac{1}{9}$$

$$27 \rightarrow \frac{1}{9} \times 27$$

$$= 3 \text{ kite}$$

S2. Ans.(b)

Sol.

$$\text{Cow} \rightarrow 60\%$$

$$\text{Buffalo} \rightarrow 30\%$$

$$\text{Both} \rightarrow 15\%$$

$$\text{Only Cow} \rightarrow 60\% - 15\% \rightarrow 45\%$$

$$\text{Only Buffalo} \rightarrow 30\% - 15\% \rightarrow 15\%$$

Total family having a cow or buffalo

$$= 45\% + 15\% + 15\%$$

$$= 75\%$$

$$100\% \rightarrow 96$$

$$1\% \rightarrow \frac{96}{100}$$

$$25\% \rightarrow 24$$

S3. Ans.(a)

Sol.

$$\text{Seats} \uparrow \rightarrow 25\%$$

$$\text{Cost/ticket} \uparrow \rightarrow 10\%$$

Revenue generated = Seats  $\times$  Cost/ticket

$$= 25 + 10 + \frac{25 \times 10}{100}$$

$$= 37.5\%$$

S4. Ans.(b)

Sol.

$$\text{Total ticket sold} = 9900$$

20% sold at half price.

$$\text{S.P} \rightarrow \frac{1}{5} \times 9900 \times \text{Rs. } 10.$$

$$\text{Rest at Rs. } 20 \rightarrow \frac{4}{5} \times 9900 \times \text{Rs. } 20$$

$$\text{Total S.P} \rightarrow 9900 \times 2 + 9900 \times 16$$

$$= 9900 \times 18$$

$$= 178200$$

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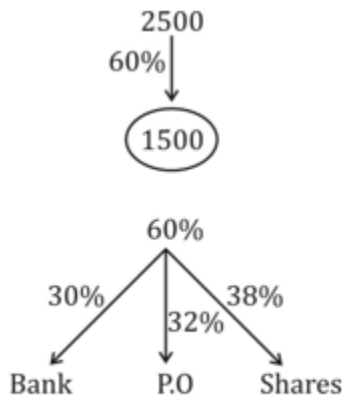
S5. Ans.(b)

Sol.

$$\begin{aligned} 24\text{-carat} &\rightarrow 100\% \\ 22\text{-carat} &\rightarrow \frac{100}{24} \times 22 \\ &= 91\frac{2}{3}\% \end{aligned}$$

S6. Ans.(b)

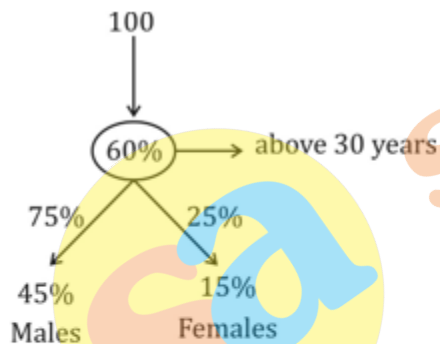
Sol.



$$38\% \text{ of } 1500 = 570$$

S7. Ans.(a)

Sol.



$$\begin{aligned} 45\% &\rightarrow 1350 \\ 1\% &\rightarrow \frac{1350}{45} \\ 100\% &\rightarrow \frac{1350}{45} \times 100 \\ &= 3000 \end{aligned}$$

S8. Ans.(b)

Sol.

	Water	Pulp	
F	68%	32%	→ 100 kg
D	20%	80%	

100% → 100 kg.  
 32% pulp → 32 kg.  
 This pulp will be same in dry fruit.  
 So, 80% → 32 kg.  
 $1\% \rightarrow \frac{32}{80} \text{ kg.}$   
 $100\% \rightarrow \frac{32}{80} \times 100$   
 = 40 kg

S9. Ans.(d)

Sol.

$62\frac{1}{2}\% \rightarrow \frac{5}{8}$   
 and  $12\frac{1}{2}\% \rightarrow \frac{1}{8}$   
 height of pole → 192 m.  
 In 1<sup>st</sup> hr →  $\frac{5}{8} \times 192 = 120\text{m}$   
 Rest height to be climbed = 72m  
 In 2<sup>nd</sup> hr →  $\frac{1}{8} \times 72\text{m}$   
 = 9 m.

S10. Ans.(d)

Sol.

21% of 100 = 21  
 In this, a person buy 3 kg more  
 So, reduced price/ kg →  $\text{Rs. } \frac{21}{3} = \text{Rs. } 7.$

S11. Ans.(b)

Sol. Let the height of cone h metre

⇒ Total area of ground will be required

$$= 5 \times 16 \text{ m}^2 = 80 \text{ m}^2$$

⇒ Total volume of air is needed

$$= 100 \times 5 \text{ m}^3 = 500 \text{ m}^3$$

⇒ volume of cone =  $500 \text{ m}^3$

$$\Rightarrow \frac{1}{3} \text{ area of ground} = 500$$

$$\Rightarrow \frac{1}{3} \times \pi r^2 \times h = 500$$

$$= \frac{1}{3} \times 80 \times h = 500$$

$$\Rightarrow \text{height} = \frac{500 \times 3}{80}$$

⇒ height of cone = 18.75 metres

S12. Ans.(d)

Sol. Volume of cone = Lateral

Surface Area

$$\frac{1}{3} \pi r^2 h = \pi r l \quad (l = \sqrt{h^2 + r^2})$$

$$\frac{r h}{3} = \sqrt{h^2 + r^2}$$

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Squaring both sides

$$\frac{1}{9} = \frac{h^2 + r^2}{r^2 h^2}$$

$$\frac{1}{9} = \frac{h^2}{r^2 h^2} + \frac{r^2}{r^2 h^2}$$

$$\frac{1}{9} = \frac{1}{r^2} + \frac{1}{h^2}$$

**S13. Ans.(d)**

**Sol.** Let the MP of saree = Rs. 100

$$\text{SP of saree} = 100 \times \frac{3}{4} = \text{Rs. } 75$$

$$\text{CP of saree} = 75 \times \frac{100}{85} = \text{Rs. } \frac{1500}{17}$$

$$\text{CP} : \text{SP} = \frac{1500}{17 \times 75} = 20 : 17$$

**S14. Ans.(c)**

$$\text{Sol.} \left( p + q - \frac{pq}{100} \right) \%$$

**S15. Ans.(b)**

**Sol.** Total marks =  $30 \times 3$

$$= 90$$

$$90 - 40 = 50$$

$$\text{Wrong questions} = \frac{50}{3+2} = 10$$

$$\text{Correct questions} = 20$$

**S16. Ans.(c)**

**Sol.** Time taken by them to cross each other

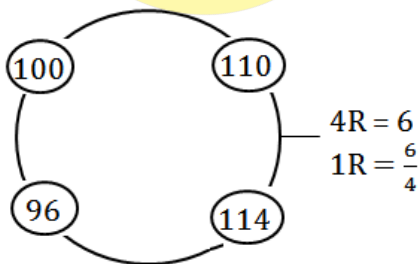
$$= \frac{l_1 + l_2}{\text{Relative speed in opposite direction}}$$

$$\text{Time} = \frac{(108 + 112)}{(45 + 54) \times \frac{5}{18}} = \frac{220 \times 18}{99 \times 5}$$

$$\text{Time} = 8 \text{ second}$$

**S17. Ans.(c)**

**Sol.**



$$96 \times \frac{75}{400} = 18$$

$$\text{C.P} = 100 \times \frac{6}{4} = 150$$

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**S18. Ans.(a)**

$$\text{Sol. C. P}_2 = 80 \times 13.5$$

$$= 1080$$

$$\text{C. P}_2 = 1920$$

$$\text{Total C.P} = 1080$$

$$\text{S.P.} = 3000 \times \frac{120}{100}$$

$$\text{S.P.} = 3600$$

$$/\text{kg S.P.} = \frac{3600}{200}$$

$$= 18/\text{kg}$$

**S19. Ans.(c)**

$$\text{Sol. } \sin \theta + \sin^2 \theta = 1$$

$$\Rightarrow \sin \theta = 1 - \sin^2 \theta$$

$$\sin \theta = \cos^2 \theta \quad \dots(i)$$

$$\cos^2 \theta + \cos^4 \theta$$

$$\Rightarrow \sin \theta + (\sin \theta)^2$$

$$= \sin \theta + \sin^2 \theta$$

$$= 1$$

**S20. Ans.(b)**

$$\text{Sol. } \sin 15^\circ = \sin (45^\circ - 30^\circ)$$

$$= \sin 45^\circ \cos 30^\circ - \cos 45^\circ \sin 30^\circ$$

$$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} - \frac{1}{\sqrt{2}} \times \frac{1}{2}$$

$$= \frac{\sqrt{3}}{2\sqrt{2}} - \frac{1}{2\sqrt{2}}$$

$$= \frac{\sqrt{3} - 1}{2\sqrt{2}}$$

**S21. Ans.(a)**

$$\text{Sol. First polynomial} = 6x^3 + 60x^2 + 150x$$

$$= 6x(x^2 + 10x + 25) = 3 \times 2 \times x \times (x + 5)^2$$

$$\text{Second polynomial} = 3x^4 + 12x^3 - 15x^2$$

$$= 3x^2(x^2 + 4x - 5) = 3x^2(x^2 + 5x - x - 5) = 3x^2(x + 5)(x - 1)$$

$$\therefore \text{Required LCM} = 3 \times 2 \times x^2 \times (x + 5)^2 (x - 1) = 6x^2 (x + 5)^2 (x - 1)$$

**S22. Ans.(b)**

$$\text{Sol. } \because x - k \text{ is a factor of } 2x^2 - kx - 9$$

$$\therefore 2k^2 - k^2 - 9 = 0$$

$$\therefore k = \pm 3$$

$$\text{But factor of } (x^2 + x - 12) \text{ are } (x + 4), (x - 3)$$

$$\text{Hence value of } k \text{ is } 3.$$

**S23. Ans.(a)**

**Sol.** Required remainder =  $3(2y)^3 - 2(2y)^2 y - 13(2y)y^2 + 10y^3$  (using factor theorem)  
 $= 24y^3 - 8y^3 - 26y^3 + 10y^3 = 34y^3 - 34y^3 = 0$

**S24. Ans.(d)**

**Sol.**

Let the numbers be x and y

$$2x + 3y = 36$$

$$3x + 2y = 39$$

$$4x + 6y = 72$$

$$9x + 6y = 117$$

$$\hline 5x = 45$$

$$\therefore x = 9$$

$$2 \times 9 + 3y = 36$$

$$y = \frac{36 - 18}{3} = 6$$

$\therefore$  Smaller number is 6

**S25. Ans.(d)**

**Sol.**

Let x and y be the numbers,

$$\therefore x + y = 20, x - y = 8$$

$$\Rightarrow x = 14, y = 6$$

$$x^2 - y^2 = 14^2 - 6^2$$

$$= (14 + 6)(14 - 6) \Rightarrow 20 \times 8 = 160$$

**S26. Ans.(d)**

**Sol.** By 101 which is the smallest 3-digit prime number.

**S27. Ans.(b)**

**Sol.** The number is  $68 \times 269 = 18292$ . 18292, when divided by 67, leaves a remainder of 1.

**S28. Ans.(d)**

**Sol.** The mode is the value which appears the most often in the data. It is possible to have more than one mode if there is more than one value which appears the most.

**S29. Ans.(c)**

**Sol.** To find the median, you need to put the values in order, then find the middle value. If there are two values in the middle, then you find the mean of these two values.

Series = 20, 21, 27, 28, 38, 39, 49

Median = 28

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S30. Ans.(a)

Sol.

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

20            21

20            21

20            21

20            21

$$\frac{160000}{20} : (21)^4$$

$$160000r \rightarrow 160000$$

$$1r \rightarrow 1$$

$$(21)^4 r \rightarrow 194481$$

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