Quant Mega Quiz for SSC Tier-1 (Solutions)

S1. Ans.(c)
Sol.
Let capital of A = x
Then, capital of B = 2x
Capital of C = 2.5x
A : B : C = x × 4 : 2x × 6 : 2.5x × 12 = 2 : 6 : 15
∴ Share of B = $\frac{6}{2+6+15} \times 5819$ = Rs 1,518/-

S2. Ans.(b)
Sol.
Perimeter of square = Twice the perimeter of rectangle
4 side = 2 × 2 (length + breadth)
56 = 4 (9 + breadth) ⇒ 9 + breadth = 14
Breadth of rectangle = 5 cm
∴ Perimeter of square = 4 × side
56 = 4 × side
Side of square = 14 cm
Difference between side of square and breadth of square
= side – breadth = 14 – 5
∴ Required difference = 9 cm

S3. Ans.(b)
Sol.
T = 2 years
P = Rs 16,250/-
C.I. = Rs 5,616/-
R = ?

$$A = P\left(1+\frac{R}{100}\right)^{T}$$

$$P + C.I. = P\left(1+\frac{R}{100}\right)^{T}$$

$$16250 + 5616 = 16250\left(1+\frac{R}{100}\right)^{2}$$

$$\frac{21866}{16250} = \left(1+\frac{R}{100}\right)^{2}$$

$$\frac{841}{625} = \left(1+\frac{R}{100}\right)^{2}$$

$\Rightarrow \left(\frac{29}{25}\right)^2 = \left(1 + \frac{R}{100}\right)^2$

$\frac{29}{25} = 1 + \frac{R}{100}$

$\frac{29}{25} = \frac{100 + R}{100}$

$2900 = 2500 + 25R$

$25R = 400$

$\Rightarrow$ R = 16%

S4. Ans.(d)

Sol.

Let quantity of milk in mixture = 4x litre

Quantity of water in mixture = 3x litre

According to question,

$\frac{4x}{3x + 6} = \frac{8}{7}$

28x – 24x = 48

X = 12

∴ Quantity of milk in original mixture

= 4x = 4 × 12 = 48 litre

S5. Ans.(b)

Sol.

Area of square = $(Side)^2$

$3136 = (Side)^2$

Side = 56 cm

Perimeter of square = 4 × Side = 4 × 56

= 224 cm

According to question,

Diameter of circle = Perimeter of square

2r = 224

∴ Circumference of circle $= 2\pi r = 224 \times \frac{22}{7}$

= 704 cm

S6. Ans.(a)

Sol.

Let the amount to be distributed = Rs x

B's original share $= \frac{3}{9} \times x = \frac{x}{3}$

B got $= \frac{2}{14} \times x = \frac{x}{7}$

According to the question

$\frac{x}{3} - \frac{x}{7} = 40$

$\frac{7x - 3x}{21} = 40$

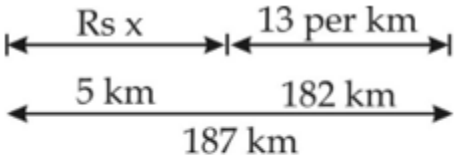
$\Rightarrow$ 4x = 840 $\Rightarrow$ x = 210

∴ Amount to be distributed among A, B and C

= Rs 210/-

S7. Ans.(c)

Sol.



Total fare of bus = x + 13 × 182

2402 = x + 2366

x = 36

∴ Value of x = Rs 36/-

S8. Ans.(c)

Sol.

Perimeter of Semi Circle

= 36 cm

$\pi r + 2r = 36$

$r = \frac{36}{(\pi + 2)} = \frac{36 \times 7}{22 + 14}$

= 7

Area $= \frac{1}{2}\pi r^2$

$= \frac{1}{2} \times \frac{22}{7} \times 7 \times 7$

$= 77\ cm^2$

S9. Ans.(d)

Sol.

A juice centre requires guaves for 28 days

= 35 dozen

For 1 day it requires guavas $= \frac{35}{28}$ dozen

∴ For 36 days it requires guavas $= \frac{35}{28} \times 36$

$= 45$ dozen

S10. Ans.(a)

Sol.

Let two-digit number = 10x + y

According to question

x + y = 12 ..(i)

and $|x - y| = 6 \Rightarrow x - y = \pm 6$ ..(ii)

By solving equation (i) and (ii)

x = 9 or x = 3

y = 3 or y = 9

∴ Required two-digit number

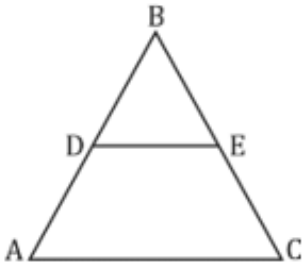
= 10x + y = 10 × 9 + 3 Or 10x + y = 10 × 3 + 9

= 90 + 3 = 93 or 30+9 = 39

93 & 39 both can be the answers

So, Either (a) or (c)

S11. Ans.(a)
Sol.



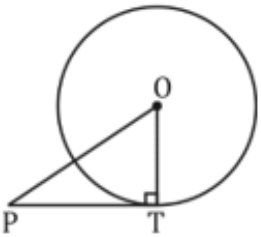
$\frac{BC}{BE} = \frac{AB}{BD}$

$= \frac{5}{2}$

$\frac{EC}{BE} = \frac{3}{2}$

$\frac{BE}{EC} = \frac{2}{3}$

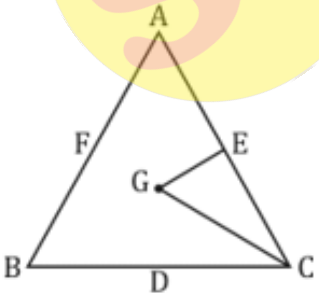
S12. Ans.(a)
Sol.



PT = 8 cm, OT = 6 cm

OP = $\sqrt{64 + 36} = 10$

S13. Ans.(b)
Sol.



Area ΔCGE

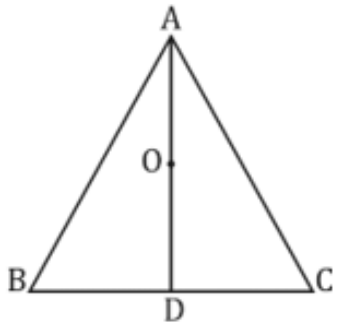
$= \frac{1}{6}\Delta ABC$

$= \frac{1}{6} \times 36$

$= 6\ cm^2$

S14. Ans.(a)

Sol.



AO : OD ⇒ 2 : 1

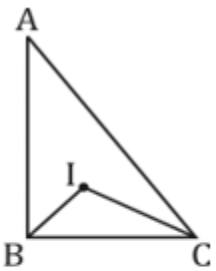
2r → 10

1r → 5 cm

OD = 5 cm

S15. Ans.(b)

Sol.



$\angle A = 180 - (90 + 70)$

$= 180 - 160$

$= 20°$

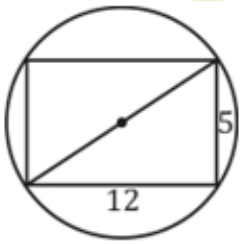
$\angle BIC = 90 + \frac{20}{2}$

$= 90 + 10$

$= 100°$

S16. Ans.(b)

Sol.



Diagonal = $\sqrt{144 + 25}$

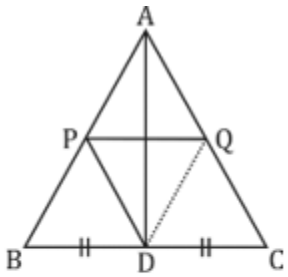
$= \sqrt{169}$

$= 13$

Radius = $\frac{13}{2}$ = 6.5 cm

S17. Ans.(b)

Sol.



AD ⊥ BC

$\angle ADC = 90°$

$\angle ADQ = \frac{90}{2} = 45°$

$\angle ADP = \frac{90}{2} = 45°$

$\angle PDQ = 45° + 45° = 90°$

S18. Ans.(c)

Sol.

Initial → 2 : 3 : 5

New → 4 : 5 : 7

(4 – 2) or (5 – 3) or (7 – 5)

2 ratio ⇒ 40

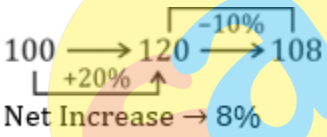
1 ratio → 20

Initial no. of students = 10 × 20

= 200

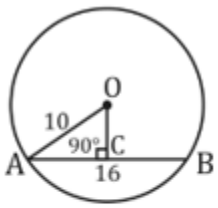
S19. Ans.(c)

Sol.



S20. Ans.(b)

Sol.



AC = 16/2 = 8

$10^2 = 8^2 + OC^2$

$100 = 64 + OC^2$

$OC^2 = 36$

OC = 6 cm

S21. Ans.(c)
Sol.
$\sec^2\theta + \tan^2\theta = \sqrt{3}$ ...(i)
$\sec^2\theta - \tan^2\theta = 1$ ...(ii)
Multiplying (i) & (ii)
$\sec^4\theta - \tan^4\theta = \sqrt{3} \times 1$
$\sec^4\theta - \tan^4\theta = \sqrt{3}$

S22. Ans.(b)
Sol.
$\sin A = \cos B$
$A = B = 45°$
$\angle C = 180° - 90° = 90°$
$\cos 90° = 0$

S23. Ans.(a)
Sol.
$2 \sin\theta \cos\theta = 1$
$\sin 2\theta = 1$
$\sin 2\theta = \sin 90°$
$2\theta = 90°$
$\theta = 45°$
$\sin 45° - \cos 45°$
$= 0$

S24. Ans.(b)
Sol.
$\cos^2 20° + \cos^2 70°$
$\Rightarrow \cos^2 (90° - 70°) + \cos^2 70°$
$\Rightarrow \sin^2 70° + \cos^2 70°$
$\Rightarrow 1$

S25. Ans.(d)
Sol.
$$\frac{\sin\theta}{1+\cos\theta} + \frac{\sin\theta}{1-\cos\theta}$$
$$\Rightarrow \frac{\sin\theta - \sin\theta\cos\theta + \sin\theta + \sin\theta\cos\theta}{1-\cos^2\theta}$$
$$\Rightarrow \frac{2\sin\theta}{\sin^2\theta}$$
$\Rightarrow 2 \operatorname{cosec}\theta$

S26. Ans.(c)
Sol.

$$\tan\theta = \frac{8 \rightarrow P}{15 \rightarrow B}$$

$$H = \sqrt{225 + 64}$$

$$= 17$$

$$\sin\theta = \frac{8}{17}$$

$$\frac{\sqrt{1-\sin\theta}}{\sqrt{1+\sin\theta}} = \frac{\sqrt{1-\frac{8}{17}}}{\sqrt{1+\frac{8}{17}}}$$

$$= \frac{\frac{\sqrt{9}}{\sqrt{17}}}{\frac{\sqrt{25}}{\sqrt{17}}}$$

$$= \frac{3}{5}$$

S27. Ans.(a)
Sol.

$$\frac{\cos\theta + \sin\theta\cos\theta + \cos\theta - \sin\theta\cos\theta}{1-\sin^2\theta} = 4$$

$$\frac{2\cos\theta}{\cos^2\theta} = 4$$

$$\sec\theta = 2$$

$$\theta = 60°$$

S28. Ans.(d)
Sol.

$$\sec 15\theta = \operatorname{cosec} 15\theta$$

$$\sin 15\theta = \cos 15\theta$$

$$15\theta = 45°$$

$$\theta = 3°$$

S29. Ans.(c)
Sol.

$$\tan\theta = \frac{1}{\sqrt{3}} \times \sqrt{3}$$

$$\tan\theta = 1$$

$$\tan\theta = \tan 45°$$

$$\theta = 45°$$

$$2\theta = 90°$$

S30. Ans.(d)
Sol.

$x^2 = \sin^2 30° + 4\cot^2 45° - \sec^2 60°$

$x^2 = \left(\frac{1}{2}\right)^2 + 4(1)^2 - 4$

$x^2 = \left(\frac{1}{2}\right)^2$

$x = 1/2$