Quantitative Aptitude for SSC CGL – (Solutions)

S1. Ans.(d)

Sol.

$$\left(\frac{x+1}{x}\right).\left(\frac{x+2}{x+1}\right)\left(\frac{x+3}{x+2}\right)\left(\frac{x+4}{x+3}\right)$$

$$=\frac{(x+4)}{x}$$

S2. Ans.(c)

Sol. Required percentage=(4817 -3716)/3716*100 = 30% (approx)

S3. Ans.(c)

Sol. Percentage increase in Talcum powder =(2914-1497)/1497*100 =94.6%

S4. Ans.(b)

Sol.

Required ratio = 3716: 1497 = 5 : 2

S5. Ans.(c)

Sol. The increase was 94.6% ≈ (95%) for talcum powder.

S6. Ans.(b)

Sol.

$$\frac{(788-593)}{788}\times 100 = 24.746$$

S7. Ans.(d)

Sol.

Average amount of interest paid by the Company during the given period:
= Rs. (23.4 + 32.5 + 41.6 + 36.4 + 49 .4)/ 5
= Rs. 36.66 lakhs.

S8. Ans.(b)

Sol.

$$\text{required percentage}\ \frac{(83+108+74+88)}{(342+324+336+420)}\times 100 = 24.824\%$$

S9. Ans.(c)

Sol.

Required percentage :
[(288+98+3.00+23.4+ 83)/ (420+142+3.96+49.4+98)] x 100%
= 69.45% (Approx.)

S10. Ans.(a)

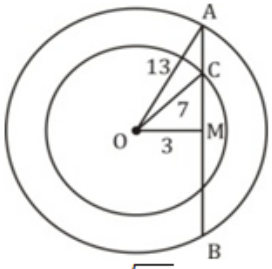
Sol.

Total expenditure of the
Company during 2000
= Rs. (324+101+3.84+41.6+74) lakhs
= Rs. 544.44 lakhs.

S11. Ans.(d)

Sol.

$\Rightarrow CM^2 = 7^2 - 3^2 = 40$

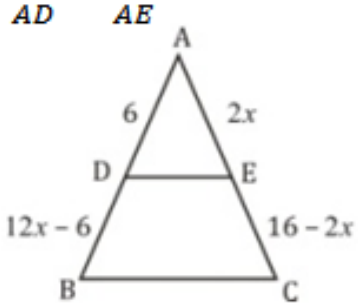


$CM = 2\sqrt{10}$ cm
In ΔAOM,
$AM = \sqrt{13^2 - 3^2} = 4\sqrt{10}$
Now, AC = AM − CM
$= 2\sqrt{10}$ cm

S12. Ans.(c)

Sol.

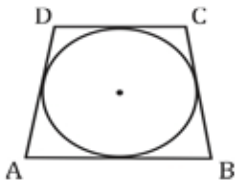
$\frac{AB}{AD} = \frac{AC}{AE}$



$\frac{12x}{6} = \frac{16}{2x} \Rightarrow x = 2$ cm

S13. Ans.(a)

Sol.



$\Rightarrow AB + CD = BC + AD$

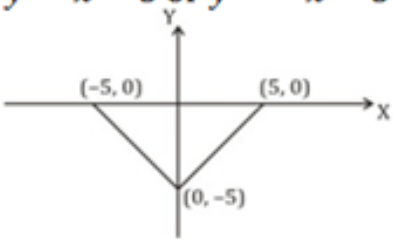
$6 + 5 = 7 + AD$

$AD = 4\,\text{cm}$

S14. Ans.(a)

Sol.

$y = x - 5$ or $y = -x - 5$



Area of the bounded region –

$= \frac{1}{2} AC \times OB = \frac{1}{2} \times 10 \times 5$

$= 25\text{sq. unit}$

S15. Ans.(c)

Sol.

Given $0° \leq \sin\theta \leq 90°$

$\sin 0° \leq \sin\theta \leq \sin 90°$

$0 \leq \frac{4x-3}{9} \leq 1 \quad \left[\because \sin\theta = \frac{4x-3}{9}\right]$

$\frac{3}{4} \leq x \leq 3$

x = 1, 2, 3 (three integral value possible)

S16. Ans.(d);

Sol.

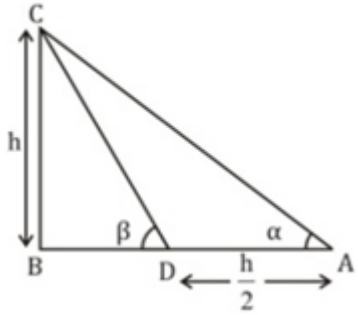
$\frac{(1-x^2)(1-x^2)}{(1-x)} \times \frac{x}{(1+x^2)} \times \frac{1}{x(1-x)} = A$

$A = 1$

S17. Ans.(c)

Sol.

In ΔCBD,



$$\tan\beta = \frac{h}{BD}$$

$$BD = \frac{h}{\tan\beta} - h\cot\beta$$

In CBA,

$$\tan\alpha = \frac{CB}{BA} = \frac{CB}{BD + DA}$$

$$\tan\alpha = \frac{h}{h\cot\beta + \frac{h}{2}}$$

$$\cot\beta + \frac{1}{2} = \frac{1}{\tan\alpha}$$

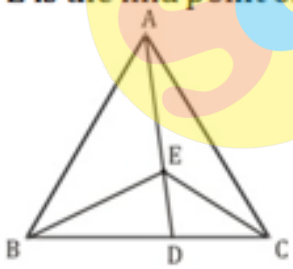
$$\cot\beta + \frac{1}{2} = \cot\alpha$$

$$\cot\alpha - \cot\beta = \frac{1}{2}$$

S18. Ans.(a)

Sol.

E is the mid point of AD. So, BE is median.



Area (ΔBED) = area (ABE)

$= \frac{1}{2}$area (ΔABD) .....(i)

Area (ΔCED) = area (AEC) $= \frac{1}{2}$ area (ACD) .....(ii)

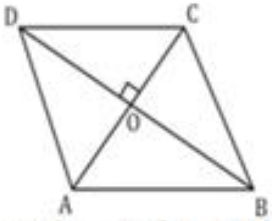
Adding (i) & (ii)

Area (ΔBEC) $= \frac{1}{2}$ area (ΔABD) $+ \frac{1}{2}$ area (ΔACD) $= \frac{1}{2}$ area (ABC)

S19. Ans.(b)

Sol.

ABCD is a quadrilateral, where AC & BD diagonal intersect each other at O. And AC⊥BD.



$AB^2 = AO^2 + BO^2$ .....(i)
$BC^2 = BO^2 + CO^2$ .....(ii)
$CD^2 = OD^2 + OC^2$ .....(iii)
$AD^2 = AO^2 + OD^2$ .....(iv)
Now,
$AB^2 + CD^2 = AO^2 + BO^2 + CO^2 + DO^2$
$AD^2 + BC^2 = AO^2 + OD^2 + OB^2 + OC^2$
so, $AB^2 + CD^2 = AD^2 + BC^2$

S20. Ans.(a)

Sol.

$\angle A = 45°$
$\angle B = 60°$
$= \cos 45°.\cos 60° + \sin 45°.\sin 60°$
$= \frac{1}{\sqrt{2}} \times \frac{1}{2} + \frac{1}{\sqrt{2}}.\frac{\sqrt{3}}{2} = \frac{\sqrt{3}+1}{2\sqrt{2}}$

S21. Ans.(c)

Sol.

$525 = P\left[\left(1 + \frac{10}{100}\right)^2 - 1\right]$
P = 2500
A.T.Q, n = 6 years, $r_1 = 20\%$
S.I. $\frac{2500 \times 20 \times 6}{100} = 3000$

S22. Ans.(a)

Sol.

$x + 2y = 800$ .....(i)
$x + 6y = 1600$ .....(ii)
$x = 400, y = 200$
Cost price of 12 Cap $= 12 \times 200 = 2400$

S23. Ans.(a)

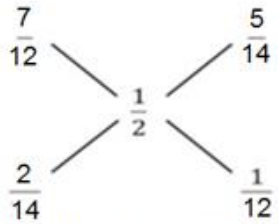
Sol. Successice % of 18% and 13% = 28.66%

Atq, (100-28.66)% of x = 1023.0156

x = 1434

S24. Ans.(a)

Sol.



Required ratio of mixture =12 : 7

Amount of former mixture = 9 liter

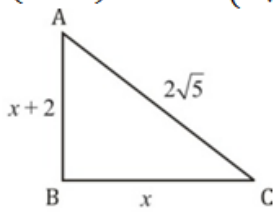
Required of the later mixture $= \frac{7\times9}{12}$

$= 5.25$ liter.

S25. Ans.(d)

Sol.

$(x+2)^2 + x^2 = \left(2\sqrt{5}\right)^2$



$x = 2$

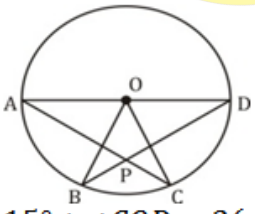
So, AB = 4, BC = 2

$\cos^2 A - \cos^2 C = \left(\frac{4}{2\sqrt{5}}\right)^2 - \left(\frac{2}{2\sqrt{5}}\right)^2 = \frac{3}{5}$

S26. Ans.(c)

Sol.

$\angle AOB + \angle COD = 2\angle ACB + 2\angle DBC$



$15° + \angle COD = 2(\angle ACB + \angle DBC)$

$15° + \angle COD = 2\angle APB$

$\angle COD = 60 - 15 = 45°$

$\tan^2 \angle APB + \cot^2 \angle COD = \tan^2 \angle APB + \cot^2 \angle COD$

$= \tan^2 30 + \cot^2 45 = \frac{4}{3}$

S27. Ans.(d)
Sol.

$$l\cos^2\theta + m\sin^2\theta = \frac{\cos^2\theta(cosec^2\theta+1)}{cosec^2\theta-1}$$

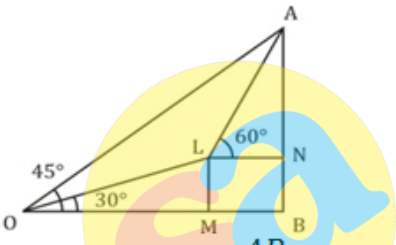
$$\frac{\cos^2\theta(1+\sin^2\theta)}{\cos^2\theta} = 1+\sin^2\theta$$
$$= \cos^2\theta + \sin^2\theta + \sin^2\theta = \cos^2\theta + 2\sin^2\theta$$
$$\Rightarrow (l-1)\cos^2\theta = (2-m)\sin^2\theta$$
$$\tan^2\theta = \frac{l-1}{2-m} \Rightarrow \tan\theta = \sqrt{\frac{l-1}{2-m}}$$

S28. Ans.(a)
Sol.

$$\sin(10°6'32") = a$$
$$\sin(90° - 79°\,53'28") = a$$
$$\cos 79°\,53'28" = a$$
$$\cos(79°\,53'28") + \tan(10°\,6'\,32")$$
$$= a + \frac{a}{\sqrt{1-a^2}} = \frac{a\left(1+\sqrt{1-a^2}\right)}{\sqrt{1-a^2}}$$

S29. Ans.(b)
Sol.

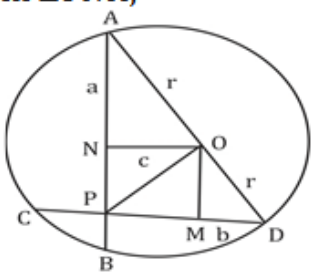
$AB = h$ km



$\Delta OAB, \tan 45° = \frac{AB}{OB}$
$OB = h$km
$\Delta OLM,$
$OM = 2\cos 30° = \sqrt{3}$ km
$LN = BM = (h - \sqrt{3})$km
$LM = 2.\sin 30° = 1$Km
In $\Delta ALN, \tan 60° = \frac{AN}{LN}$
$$\sqrt{3} = \frac{AB - BN}{LN}$$
$$\sqrt{3} = \frac{h-1}{h-\sqrt{3}}$$
$$h = (\sqrt{3}+1)\text{km}$$

S30. Ans.(c)
Sol.

In ΔONA,



$ON^2 = r^2 - a^2$

In ΔONB,

$NP^2 = OP^2 - ON^2$

$c^2 - (r^2 - a^2) = (c^2 + a^2) - r^2$

Now, In ΔOMD,

$c^2 + a^2 - r^2 = r^2 - b^2$

$2r^2 = a^2 + b^2 + c^2$

$$r = \sqrt{\frac{a^2 + b^2 + c^2}{2}}$$