Quant Mega Quiz for SSC CGL Tier-II (Solutions)

S1. Ans.(a)

Sol. $M = 0.1 + (0.1)^2 + (0.01)^2$ and $N = 0.3 + (0.03)^2 + (0.003)^2$

$M=0.1+0.01+0.0001=0.1101$

$N=0.3+0.0009+0.000009=0.300909$

$M+N=0.411009$

S2. Ans.(d)

Sol. I. $72 = 2 \times 3 \times 3 \times 2 \times 2 = 2^3 \times 3^2$

Total factor = $(3 + 1) \times (2 + 1) = 12$

II. $\Rightarrow 1 + 3 + 5 + \ldots\ldots\ldots\ldots + 39$

this series is in AP

SUM$\Rightarrow \frac{20}{2} [2 \times 1 + 19 \times 2]$

SUM$\Rightarrow 20 \times 20 \Rightarrow 400$

III. Largest two digit no. = 99

And largest two digit prime no. = 97

S3. Ans.(d)

Sol.

$A = 1 - 10 + 3 - 12 + 5 - 14 + 7 + \ldots\ldots 60^{th}$ terms

Break above series in two diff. series

$A_1 = 1 + 3 + 5 + 7 + 9 + \ldots\ldots 30^{th}$ term and $A_2 = - 10 - 12 - 14 - 16 \ldots\ldots 30^{th}$ term

Sum $(A_1) = \frac{30}{2} [2 \times 1 + (30 - 1) \times 2]$

Sum $(A_1) = 15 \times [60]$

Sum$(A)_1 = 900$

and

Sum $(A_2) = - 10 - 12 - 14 - 16 \ldots\ldots 30^{th}$ term

$A_2 = - [10 + 12 + 14 + 16 + \ldots. 30^{th}$ term$]$

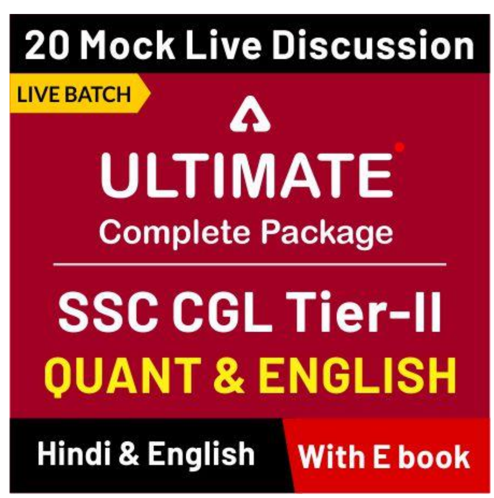
Sum $(A_2) = -\frac{30}{2} [2 \times 10 + 29 \times 2]$

Sum $(A_2) = -15 \times [78] = - 1170$

Hence

$A = A_1 + A_2$

Sum $A = 900 - 1170 \Rightarrow -270$



S4. Ans.(b)

Sol. Given

$A = \frac{0.216 + 0.008}{0.36 + 0.04 - 0.12} \Rightarrow \frac{(0.6)^3 + (0.2)^3}{(0.6)^2 + (0.2)^2 - 0.6 \times 0.2}$

as we know $\Rightarrow \frac{\mathbf{a^3 + b^3}}{\mathbf{a^2 + b^2 - ab}} \Rightarrow \frac{\mathbf{(a+b)(a^2 + b^2 - ab)}}{\mathbf{(a^2 + b^2 - ab)}}$

Hence, A ⇒ (a + b) ⇒ 0.6 + 0.2 ⇒ 0.8

Similarly,

$B = \frac{(0.9)^3 - (0.3)^3}{(0.9)^2 + (0.3)^2 + 0.9 \times 0.3} \Rightarrow \frac{a^2 - b^3}{a^2 + b^2 + ab}$

$\Rightarrow \frac{(a-b)(a^2 + b^2 + ab)}{(a^2 + b^2 + ab)} \begin{bmatrix} a^3 - b^3 = (a-b)(a^2 + b^2 + ab) \\ \& \\ a^3 + b^3 = (a+b)(a^2 + b^2 - ab) \end{bmatrix}$

B ⇒ 0.9 – 0.3 = 0.6

So, $(A^2 + B^2)^2 \Rightarrow [(0.8)^2 + (0.6)^2]^2 = 1$

S5. Ans.(a)

Sol. Let number (N) = 341x + 5 (because N is divided by 341 and leaves 5 remainder)

To find Natural nos. between 1000 to 2000 Which are divided by 341 and leaves 5 remainder, for this below condition has to be satisfy i.e

1000 < 341x + 5 < 2000

Put the values of x which satisfied above eqn.

only value(x = 3,4 & 5) are satisfying

So answer = 3 values

S6. Ans.(a)

Sol. To find the sum of natural No. which is divisible by 13 between 100 and 400 ,we should calculate Sum of no. between 1– 400, divisible by 13 is

$S_1 \Rightarrow \frac{30}{2}[2 \times 13 + (30-1) \times 13]$ $[\text{sum} = \frac{n}{2}[2 \times a + (n-1)d]$(as there are $\frac{400}{13} = 30$ numbers)

$S_1 = 15[26 + 29 \times 13]$..........(1)

Sum of no. between 1–100, divisible by 13 is

$S_2 \Rightarrow \frac{7}{2}[2 \times 13 + 6 \times 13]$

$S_2 \Rightarrow 7 \times 13 \times 4$ ....(2)

∴ sum of No. between 100-400 are = $S_1 - S_2 = 5681$

S7. Ans.(a)

Sol.

(i) $\sqrt{64} + \sqrt{0.0064} + \sqrt{0.81} + \sqrt{0.0081} = 9.07$

Taking square root of LHS

8 + 0.08 + 0.9 + 0.09 = 9.07

9.07 = 9.07 ✓(LHS=RHS)

(ii) $\sqrt{(0.010201)} + \sqrt{98.01} + \sqrt{0.25}$ = 11.51

⇒ taking square root of LHS

⇒ 0.101 + 9.9 + 0.5

⇒ 10.501 ≠ 11.51 ×(LHS≠RHS)

So only (i) correct

S8. Ans.(d)

Sol. No number except 10080 is divisible by 7.
Further, 80 is divisible by 4.
$1 + 0 + 0 + 8 + 0 = 9$ is divisible by 3 and 10080 is also divisible by 5.

S9. Ans.(b)

Sol. (i) $(0.7)^2 + (0.07)^2 + (11.1)^2 > 123.8$
LHS⇒ 0.49 + 0.0049 + 123.21
LHS ⇒ 123.70 $\ngtr$ 123.8 ×(not correct)
(ii) $(1.12)^2 + (10.3)^2 + (1.05)^2 > 108.3$
⇒ $[(1+0.12)^2] + [(10 + 0.3)^2] + [(1+0.05)^2]$
⇒ [1+0.0144 + 0.24] + [100 + 0.09 + 6] + [1 + 0.0025 + 0.1]
⇒ 108.4469 > 108.3 ✓(correct)
So, only (ii) Answer

So, all are true

S10. Ans.(a)

Sol. I. $\sqrt{12} > \sqrt[3]{16} > \sqrt[4]{24}$
$(12)^{\frac{12}{2}} > (16)^{\frac{12}{3}} > (24)^{\frac{12}{4}}$
$(12)^6 > (16)^4 > (24)^3$
144 × 144 × 144 > 32 × 32 × 64 > 24 × 24 × 24
II. $\sqrt[3]{25} > \sqrt[4]{32} > \sqrt[6]{48}$
$(25)^{\frac{12}{3}} > (32)^{\frac{12}{4}} > (48)^{\frac{12}{6}}$
$(25)^4 > (32)^3 > (48)^2$
25 × 25 × 25 × 25 > 32 × 32 × 32 > 48 × 48
625 × 625 > 256 × 128 > 48 × 48
III. $\sqrt[4]{9} > \sqrt[3]{15} > \sqrt[6]{24}$
$(9)^{\frac{12}{4}} > (15)^{\frac{12}{3}} > (24)^{\frac{12}{6}}$
$(9)^3 > (15)^4 > (24)^2$
$9 \times 9 \times 9 \ngtr 15 \times 15 \times 15 \times 15 > 24 \times 24$

Only I and II

S11. Ans.(d)

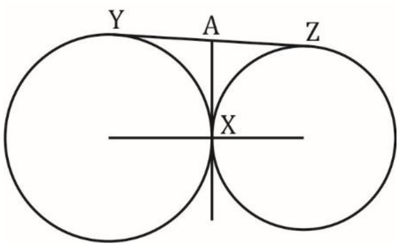
Sol.

I. $\left(\frac{0.03}{0.2}\right) + \left(\frac{0.003}{0.02}\right) + \left(\frac{0.0003}{0.002}\right) + \left(\frac{0.00003}{0.0002}\right) = 0.6$
$\frac{3}{2} \times 10^{-1} + \frac{3}{2} \times 10^{-1} + \frac{3}{2} \times 10^{-1} + \frac{3}{2} \times 10^{-1} = 0.6$
$10^{-1}\left[\frac{3}{2} \times 4\right] = 0.6$
$\frac{6}{10} = 0.6$
0.6 = 0.6
LHS = RHS
II. $(0.01) + (0.01)^2 + (0.001)^2 = 0.010101$

 0.01
 0.0001
0.000001
\+
____
0.010101

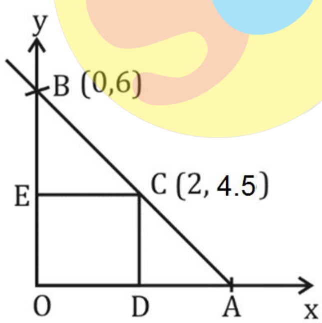
So, Both I & II are correct

S12. Ans.(a)
Sol.
$\frac{1}{(0.1)^2}+\frac{1}{(0.01)^2}+\frac{1}{(0.5)^2}+\frac{1}{(0.05)^2}$
$\Rightarrow 100+10000+\frac{100}{25}+\frac{10000}{25}$
⇒ 100 + 10000 + 4 + 400
⇒ 10504

S13. Ans.(d)
Sol.


According to diagram
YA &AX are tangent to bigger circle
So YA=AX=16
similarly for smaller circle
AZ & AX are tangent
Hence AZ=AX=16
THEREFORE
YZ = AY+AZ
YZ = 16+16
YZ = 32

S14. Ans.(b)
Sol. LCM of 8, 11, 6 and 7 = 1848
Required number of mangoes = 1848 + 5 = 1853

S15. Ans.(c)
Sol.


$\frac{x}{8}+\frac{y}{6}=1$
OA = 8, OD = 2 unit
Again, OB = 6 unit, OE = 4.5 unit
∴ Required area of ΔBEC and ΔDCA together = area of Δ OAB - area of rectangle ODCE
$=\left(\frac{1}{2}\times 8\times 6\right)-(2\times 4.5)=24-9=15\text{ unit}^2$

S16. Ans.(c)

Sol. After I[st] discount selling price is

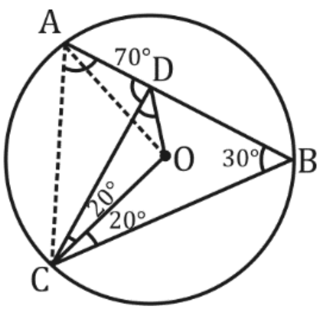
$800 \times \frac{80}{100} = 640$

II[nd] discount = 640 – 560 = 80

Required discount percent (x) = $\frac{80}{640} \times 100 = 12\frac{1}{2}\%$

S17. Ans.(b)

Sol.



Join AO & AC

So,

∠AOC = 2 ∠ABC = 60

⇒ ∠ACO = ∠CAO = 60° (Since, AO = OC) ⇒ CA=AO=CO

∴ ACD = 40°

& ∠CAB = 180° - 80° - 30° = 70°

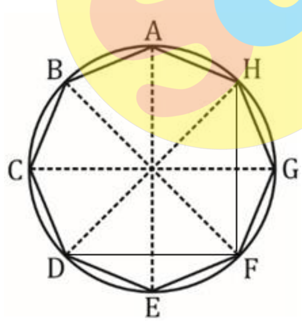
& ∠CDA = 180° - 70° - 40° = 70°

∴ CA = CD = CO

$\Rightarrow \angle CDO = \frac{(180-20)}{2} = 80$

S18. Ans.(b)

Sol.



DH = diameter

As

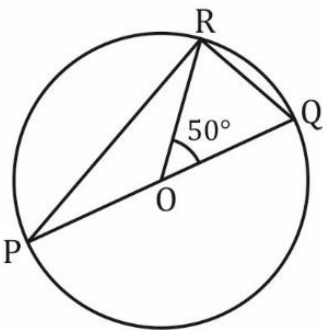
FD = FH = same distance between two sides

& ∠DFH = 90° (angle in a semi-circle)

So, ∠HDF = ∠FHD = $\frac{90}{2}$ = 45°

S19. Ans.(b)

Sol.



$\angle ROQ = 50$

$\angle ROP = \angle(180 - 50) = \angle 130$

AS

RO=OP(RADIUS OF CIRCLE)

THEREFORE

$\angle RPO = \angle ORP = \frac{180 - 130}{2} = 25°$

S20. Ans.(d)

Sol.

I. $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\ldots\left(1+\frac{1}{998}\right) > 497$

$\Rightarrow \frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \ldots \ldots . \ldots \frac{999}{998} > 497$

$\Rightarrow \frac{999}{2} > 497$

II. $14\frac{3}{4} + 5\frac{1}{4} - 2\frac{1}{2} > 11\frac{1}{8} + 12\frac{3}{8} - 7\frac{1}{4}$

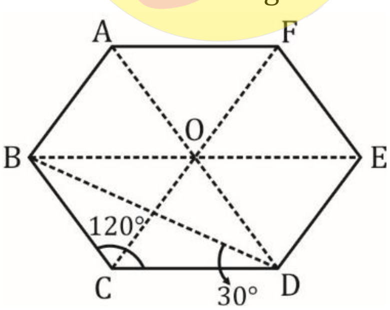
$14 + 5 - 2 + \left[\frac{3}{4} + \frac{1}{4} - \frac{1}{2}\right] > 11 + 12 - 7 + \left[\frac{1}{8} + \frac{3}{8} - \frac{1}{4}\right]$

$17 + \frac{1}{2} > 16 + \frac{1}{4}$

So, Both I and II

S21. Ans.(b)

Sol. ABCDEF is a regular hexagon



Each interior angle of regular hexagon is $\frac{(6-2)\times 180}{6}$=120=$\angle BCD$

In regular hexagon, there are six equilateral triangle as shown by the dotted line.

So, ΔCOD is also equilateral triangle

$\angle BCD = 120$

$BC = CD$ So, $\angle CBD = \angle CDB = \frac{(180 - 120)}{2} = 30$

$\angle BDC = 30$, $\angle ODC = 60$,

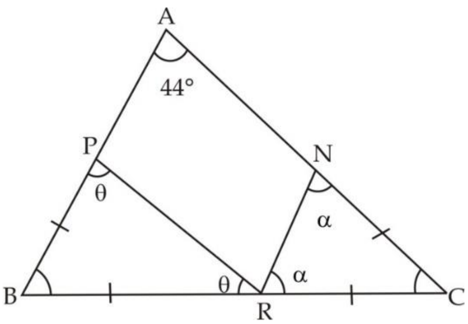
So,

Angle $ADB = (60 – 30)$

$\angle ADB = 30°$

S22. Ans.(c)

Sol.



$\because BP = BR$

$\Rightarrow \angle BPR = \angle BRP = \theta$

$\because CN = CR$

$\Rightarrow \angle CRN = \angle CNR = \alpha$

$\therefore \angle PBR = 180 – 2\theta$

& $\angle NCR = 180 – 2\alpha$

Now, in ΔABC

$\angle BAC + \angle ABC + \angle ACB = 180°$

$\Rightarrow 44° + (180 – 2\theta) + (180 - 2\alpha) = 180°$

$\Rightarrow 2(\theta + \alpha) = 44° + 180°$

$\Rightarrow \theta + \alpha = 112°$

$\therefore \angle PRN = 180° - (\theta + \alpha)$

$= 180 – 112$

$\angle PRN = 68°$

S23. Ans.(d)

Sol. ATQ

$\angle A : \angle B : \angle C = 3 : 2 : 1$

$\therefore \angle A = 3x, \angle B = 2x, \angle C = x$

In ΔABC

$\Rightarrow \angle A + \angle B + \angle C = 180°$

$\Rightarrow 3x + 2x + x = 180°$

$\Rightarrow x = 30°$

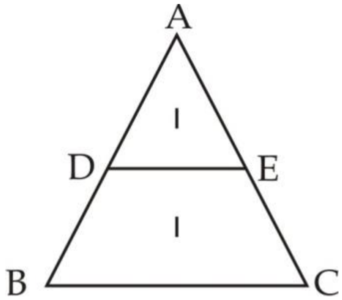
$\therefore \angle C = 30°$

$\angle ECD = 180 - \angle C - \angle ACE$

$= 180° - 30° - 90° = 60°$

S24. Ans.(b)

Sol.



Ar ΔADE = 1

Ar ΔABC = 2

$\Rightarrow \frac{\text{ar } \Delta ABC}{\text{ar } \Delta ADE} = \frac{\text{Side of } \Delta ABC\ (AB)^2}{\text{Side of } \Delta ADE\ (AD)^2}$

$\Rightarrow \frac{\sqrt{2}}{1} = \frac{AB}{AD}$

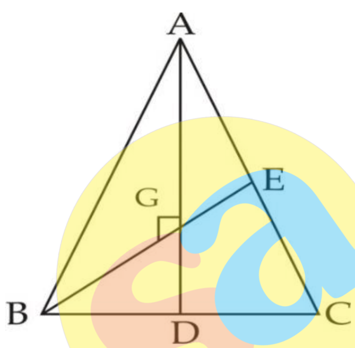
∴ DB = AB – AD

$= \sqrt{2} - 1$

∴ DB : AB = $(\sqrt{2}$ -1) : $\sqrt{2}$

S25. Ans.(b)

Sol.



ATQ,

→ Medians AD & BE intersect at G on 90°

→ ∠AGB = 90° ⇒ ΔAGB is a right angled Δ.

⇒ In a Δ centroid divides median in the ratio 2 : 1,

$BG = \frac{2}{3} \times BE = \frac{2}{3} \times 12 = 8$

$\& \ AG = \frac{2}{3} \times AD = \frac{2}{3} \times 9 = 6$

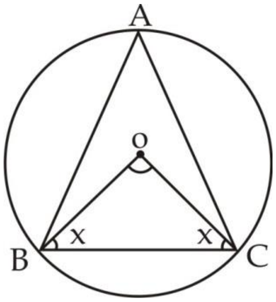
∴ In ΔAGB

$AB^2 = AG^2 + BG^2$

$= 6^2 + 8^2 = 36 + 64 = 100$

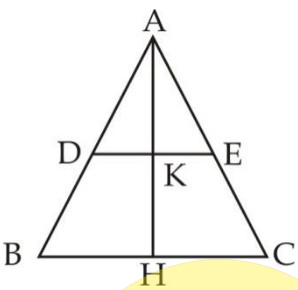
⇒ AB = 10 cm

S26. Ans.(c)
Sol.



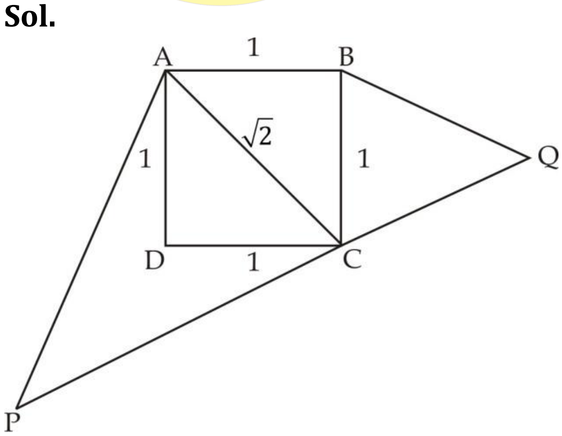
Let ∠OBC = ∠OCB = x
{∵ OB = OC = circum radius}
Now,
Angle made by same chord at the centre is double than that of any other part on the circumference at same sector.
∵ ∠BOC = 180° - 2x
∴ $\angle BAC = \frac{180-2x}{2} = 90° - x$
⇒ ∠OBC + ∠BAC = x + 90 –x = 90°

S27. Ans.(b)
Sol.



∵ Point D & E are mid points of sides AB and AC
∴ DE will be parallel to BC
(By Thales theorem)
⇒ DE will cut AH into equal parts
∴ AK : KH = 1 : 1

S28. Ans.(c)
Sol.



ATQ,

$\Delta QBC \sim \Delta PAC$

$\Rightarrow$ let each side of square = 1

$\Rightarrow$ diagonal of square $=\sqrt{2}$

$\because \Delta QBC \sim \Delta PAC$

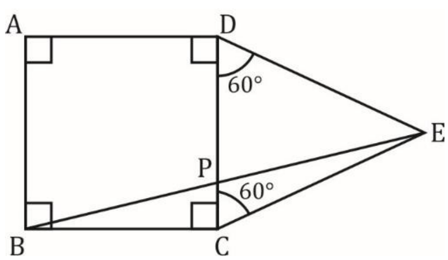
$\Rightarrow \frac{\text{Area of } \Delta QBC}{\text{Area of } \Delta PAC} = \frac{(BC)^2}{(AC)^2}$

$= \frac{(QC)^2}{(PC)^2} = \frac{(QB)^2}{(PA)^2}$

$= \frac{1^2}{(\sqrt{2})^2} = \frac{1}{2}$

S29. Ans.(a)

Sol.



All angle of square = 90°=∠DCB

∠DCE = 60 [DCE is an equilateral triangle]

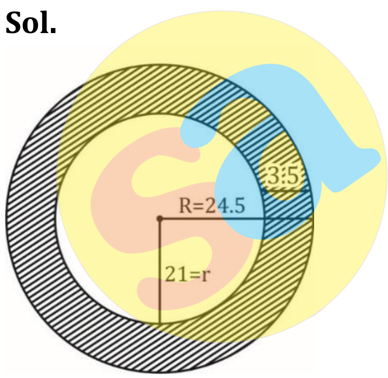
Here CB = CE,

So, $\angle CBE = \angle BEC = \frac{180 - (90 + 60)}{2}$ (BECAUSE ∠BCE=∠BCD+∠DCE=90+60)

∠CBE = ∠BEC = 15°

S30. Ans.(a)

Sol.



Radius of bigger circle(R)=24.5

Radius of smaller circle (r)=21

Area of path = Area of bigger circle – Area of smaller circle

$= \pi R^2 - \pi r^2$

$= \frac{22}{7}[(24.5)^2 - (21)^2]$

$= \frac{22}{7} \times 45.5 \times 3.5$

$= 500.5 \text{ cm}^2$