SSC CHSL Tier-I 2022-23 Memory Based (Quantitative Aptitude) (Based on 09 Mar 2023 Exams)

Q1. Rs. 16,000 A barrowed from B at the rate of 10% p.a. compound interest. What would be the Amount of compound interest after two years.
(a) Rs. 2065
(b) Rs. 3,030
(c) Rs. 3,360
(d) Rs. 3,340

Q2. If the sides of a triangle are 10cm, 17cm and 21cm then find the inradius of the circle.
(a) 2.5cm
(b) 5cm
(c) 4cm
(d) 3.5cm

Q3. If $\text{cosec}\ \theta + \cot\ \theta = \frac{25}{13}$, find the value of $\text{cosec}\ \theta$ =?
(a) $\frac{397}{325}$
(b) $\frac{425}{400}$
(c) $\frac{315}{300}$
(d) $\frac{217}{281}$

Q4. There is a circle whose radius 17cm and the chord of the circle is 30cm. Find the perpendicular distance between the center of circle from chord.
(a) 14
(b) 8
(c) 11
(d) 9

Q5. If a + b = c, then, $a^3 + b^3 - c^3 + 3abc$ = ?
(a) 1
(b) 2
(c) 0
(d) Can't determine

Q6. If $\frac{p}{q} = \frac{r}{s} = \frac{t}{u} = \frac{7}{3}$, then $\frac{4p^2-5r^2+6t^2}{4q^2-5s^2+6t^2}$ = ?
(a) $\frac{7}{3}$
(b) $\frac{343}{81}$
(c) $\frac{27}{49}$
(d) $\frac{49}{9}$

Q7. A certain type of work is completed by A in 30 days. Similar, type of work completed by B in 24 days. If Rs. 27000 is paid to A and B, then the amount earn by A is:
(a) 13,500
(b) 16,500
(c) 12,000
(d) 15,000

Q8. If $\cot\ \theta = \frac{24}{7}$, then, $\sin^2\theta$ = ?
(a) $\frac{49}{625}$
(b) $\frac{484}{27}$
(c) $\frac{49}{25}$
(d) $\frac{7}{25}$

Q9. The radius of two circles are 13cm and 6cm. The distance between the centre of the circle is 25cm find the length of the direct common tangent.
(a) 25
(b) 21
(c) 24
(d) 27

Q10. In ΔABC, ∠B = 70° and ∠C = 60°. The internal bisectors of the two smallest angles of ΔABC meet at O. The angle so formed at O is:
(a) 125°
(b) 120°
(c) 115°
(d) 110°

Q11. The average weight of 120 students in a school is 62.5 kg. 30 more students are included then the average weight of students becomes 59.5 kg. Find the average weight of 30 new students.
(a) 70 kg
(b) 59.5
(c) 47.5 kg
(d) 49 kg

Q12. If the marked price of an article is 700 Rs. It is sold after two successive discount 20% and 40%. Find the selling price of the article
(a) Rs. 336
(b) Rs. 400
(c) Rs. 286
(d) Rs. 306

Q13. Simplify the expression.
$\frac{\tan A-\sin A}{\tan A+\sin A}$
(a) $\sin^2 A$
(b) $\frac{(1-\cos A)^2}{\sin^2 A}$
(c) $\cos^2\theta$
(d) $\frac{sin^2 A}{(1+cos^2 A)}$

Q14. A person covers 40 km, in 24 minutes. If that person decreases his speed by 40%, then time take by him to cover 40 km distance is:
(a) 42 min
(b) 44 min
(c) 36 min
(d) 40 min

Q15. If a certain sum of money becomes Rs. 4030 in 3 years at 10% p.a. simple interest find the principal amount
(a) Rs. 3100
(b) Rs. 4000
(c) Rs. 2900
(d) Rs. 3125

Q16. If $k + \frac{1}{k} - 2 = 0$, then $k^{17} + \frac{1}{k^{18}} = ?$, $k > 0$
(a) 5
(b) 6
(c) 1
(d) 2

Q17. Find the value of
289 ÷ 17 × 14 + 946 - 1125
(a) 71
(b) 61
(c) 49
(d) 59

Q18. $\frac{18\times4+289\div17-125}{10+14\div7+9-5\times5}$
(a) 9
(b) 10
(c) 12
(d) 5

Q19. If a : b = 3 : 7 and c : b = 2 : 3, then a : b : c is equal to:
(a) 9 : 24 : 28
(b) 5 : 6 : 28
(c) 9 : 21 : 14
(d) 5 : 8 : 14

Q20. In ΔABC, M is a point on BC such that BM : MC = 3 : 4 and N is the mid point of BM. Then, ar(ΔABN) : ar(ΔABC) is equal to:
(a) 4 : 3
(b) 3 : 4
(c) 3 : 14
(d) 3 : 7

Q21. The radii of the two circular faces of the frustum of a cone of height 35 cm are 6 cm and 3 cm. What is its volume in cm^3? ($\pi = 22/7$)
(a) 2310
(b) 2290
(c) 2270
(d) 2340

Q22. This table shows the number of students studying in various streams in different colleges.

Streams	College				
	A	B	C	D	E
Arts	580	460	320	470	370
Science	620	680	540	360	400
Commerce	480	520	350	520	330

What is the ratio of the number of students studying science in colleges A and B together to the number of students studying commerce in colleges D and E together?
(a) 21 : 17
(b) 23 : 15
(c) 13 : 8
(d) 26 : 17

Q23. This table shows the number of students studying in various streams in different colleges.

Streams	College				
	A	B	C	D	E
Arts	580	460	320	470	370
Science	620	680	540	360	400
Commerce	480	520	350	520	330

What is the average of the number of students in the arts stream in all the colleges taken together?
(a) 450
(b) 470
(c) 440
(d) 460

Q24. This table shows the number of students studying in various streams in different colleges.

Streams	College				
	A	B	C	D	E
Arts	580	460	320	470	370
Science	620	680	540	360	400
Commerce	480	520	350	520	330

If the data about students of the commerce stream in all colleges is represented by a pie-chard, what is the central angle of the sector representing college D, to the nearest degree?
(a) 80°
(b) 82°
(c) 88°
(d) 85°

Q25. Two articles are sold for Rs. 2508 each. On one, there is a gain of 15% and on the other, there is a loss of 15%. What is the overall gain or loss percent to the nearest two decimal places?
(a) 2.75% gain
(b) 2.75% loss
(c) 2.25% gain
(d) 2.25% loss

S1. Ans.(c)
Sol. P = 16,000 r = 10% time = 2 years
Amount = $P\left(1+\frac{r}{100}\right)^t$
Amount = $16{,}000\left(1+\frac{10}{100}\right)^2$
Amount = 19,360
CI = Amount – Principal
= 19,360 – 16,000 = 3,360

S2. Ans.(d)
Sol. $S = \frac{a+b+c}{2} = \frac{10+17+21}{2} = 24cm$
Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)} = \sqrt{24\times14\times7\times3} = 84$
Inradius of circle = $\frac{Area\ of\ triangle}{Semi-perimeter} = \frac{84}{24} = 3.5cm$

S3. Ans.(a)
Sol. We know
cosec θ + cot θ = K

then

$\text{cosec}\ \theta - \cot\theta = \frac{1}{K}$

So,

$\text{cosec}\ \theta + \cot\theta = \frac{25}{13}$ _____ (i)

$\text{cosec}\ \theta - \cot\theta = \frac{13}{25}$ _____ (ii)

On adding eq. (i) & (ii)

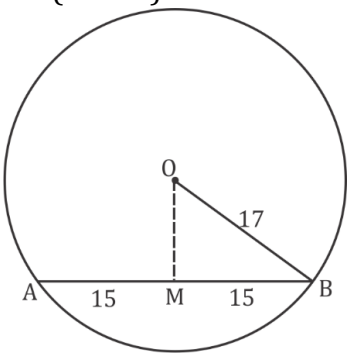
$2\text{cosec}\ \theta = \frac{25}{13} + \frac{13}{25}$

$\text{cosec}\ \theta = \frac{397}{325}$

S4. Ans.(b)

Sol. Let AB (Chord) = 30cm

OB (radius) = 17cm



$MB = \frac{AB}{2} = \frac{30}{2} = 15,$

Now,

$OM = \sqrt{OB^2 - MB^2} = \sqrt{17^2 - 15^2} = 8$

S5. Ans.(c)

Sol. We know,

$a + b + c = 0,$

then,

$a^3 + b^3 + c^3 - 3abc = 0$

So,

$a^3 + b^3 - c^3 + 3abc = 0$

S6. Ans.(d)

Sol. We know

If $\frac{p}{q} = \frac{r}{s} = \frac{t}{u} = \frac{7}{3}$

then,

$\frac{4p^2-5r^2+6t^2}{4q^2-5s^2+6t^2} = \left(\frac{7}{3}\right)^2 = \frac{49}{9}$

S7. Ans.(c)

Sol. We know

Earning $\propto$ Efficiency

	A		B
Days	30		24
Time Ratio	5	:	4
Efficiency Ratio	4	:	5

Now, Amount earn by A = $\frac{4}{9} \times 27000 = 12000$

S8. Ans.(a)

Sol. $\cot\theta = \frac{24}{7}$ $\rightarrow Base$
$\rightarrow Perpendicular$

Then,

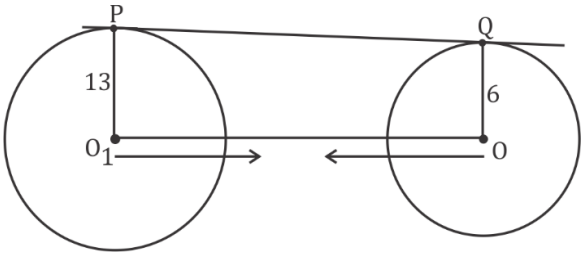
Hypotenous = 25

Now,

$\sin^2\theta = \left(\frac{7}{25}\right)^2 = \frac{49}{625}$

S9. Ans.(c)

Sol.



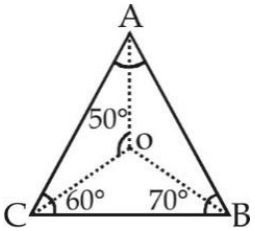
Direct common tangent

$= \sqrt{d^2 - (r_1\ r_2)^2} = \sqrt{25^2 - (13-6)^2}$

$= 24\text{cm}$

S10. Ans.(a)

Sol.



$AOC = 90 + \frac{\angle B}{2} \Rightarrow = 90 + 35 = 125°$

S11. Ans.(c)

Sol. Average weight of 30 New students

$= \frac{150\times59.5-62.5\times120}{30}$

$= \frac{1425}{30} = 47.5$

S12. Ans.(a)

Sol. SP = $700 \times \frac{80}{100} \times \frac{60}{100} = 336$

S13. Ans.(b)

Sol.

$\frac{\tan A-\sin A}{\tan A+\sin A} = \frac{\frac{\sin A}{\cos A}-\sin A}{\frac{\sin A}{\cos A}+\sin A} = \frac{\sin A(1-\cos A)}{\sin A\,(1+\cos A)}$

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

S14. Ans.(d)

Sol. Speed = $\frac{40}{24} \times 60$ = 100km/hr

Speed decreased by 40% then speed = 60km/hr

Time required to cover 40 km, = $\frac{40}{60} \times 60$ = 40 min

S15. Ans.(a)

Sol. SI for 3 year = 10 × 3 = 30%

Then

(100 + 30)% → 4030

130% → 4030

1% → 31

100% → 3100

S16. Ans.(d)

Sol.

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

then, put k = 1

$k^{17} + \frac{1}{k^{18}} = 1 + 1 = 2$

S17. Ans.(d)

Sol.

⟹ 289 ÷ 17 × 14 + 946 – 1125

⟹ 17 × 14 + 946 – 1125

⟹ 238 + 946 – 1125

⟹ 1184 – 1125 = 59

S18. Ans.(a)

Sol.

$\Longrightarrow \frac{18\times4+289\div17-125}{10+14\div7+9-5\times5}$

$\Longrightarrow \frac{72+17-125}{21-25} = \frac{-36}{-4} = 9$

S19. Ans.(c)

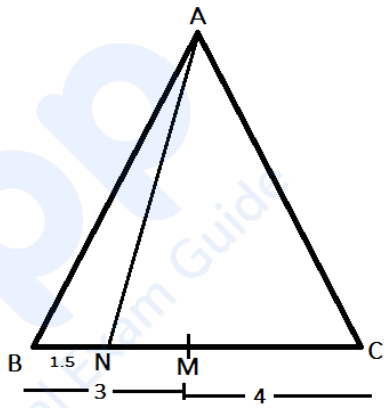
Sol.

a	:	b	:	c	
3		7			×3
		3		2	×7

⇒ 9 : 21 : 14

S20. Ans.(C)

Sol.



$\frac{ar(\Delta ABN)}{ar(\Delta ABC)} = \frac{BN}{BC} = \frac{1.5}{7} = \frac{3}{14}$ (height is same in all triangles)

S21. Ans.(a)

Sol. Volume of frustum = $\frac{\pi h}{3}\,(r^2 + R^2 + rR)$

$\Rightarrow \frac{22}{7\times3} \times 35\,(6^2 + 3^2 + 18)$

= 2310 cm^3

S22. Ans.(d)

Sol. Science in A and B = 620+680

=1300

Commerce in D and E = 850

Required ratio = 1300: 850

= 26: 17

S23. Ans.(c)

Sol. Req. avg = $\frac{2200}{5} = 440$

S24. Ans.(d)

Sol. Required angle $=\frac{520}{2200} \times 360°$

$= 85$

S25. Ans.(d)

Sol.

CP	SP
100_{x85}	115_{x85}
100_{x115}	85_{x115}
20,000	19,550

-450

LOSS % $= \frac{450}{20,000} X\ 100 = 2.25\%$