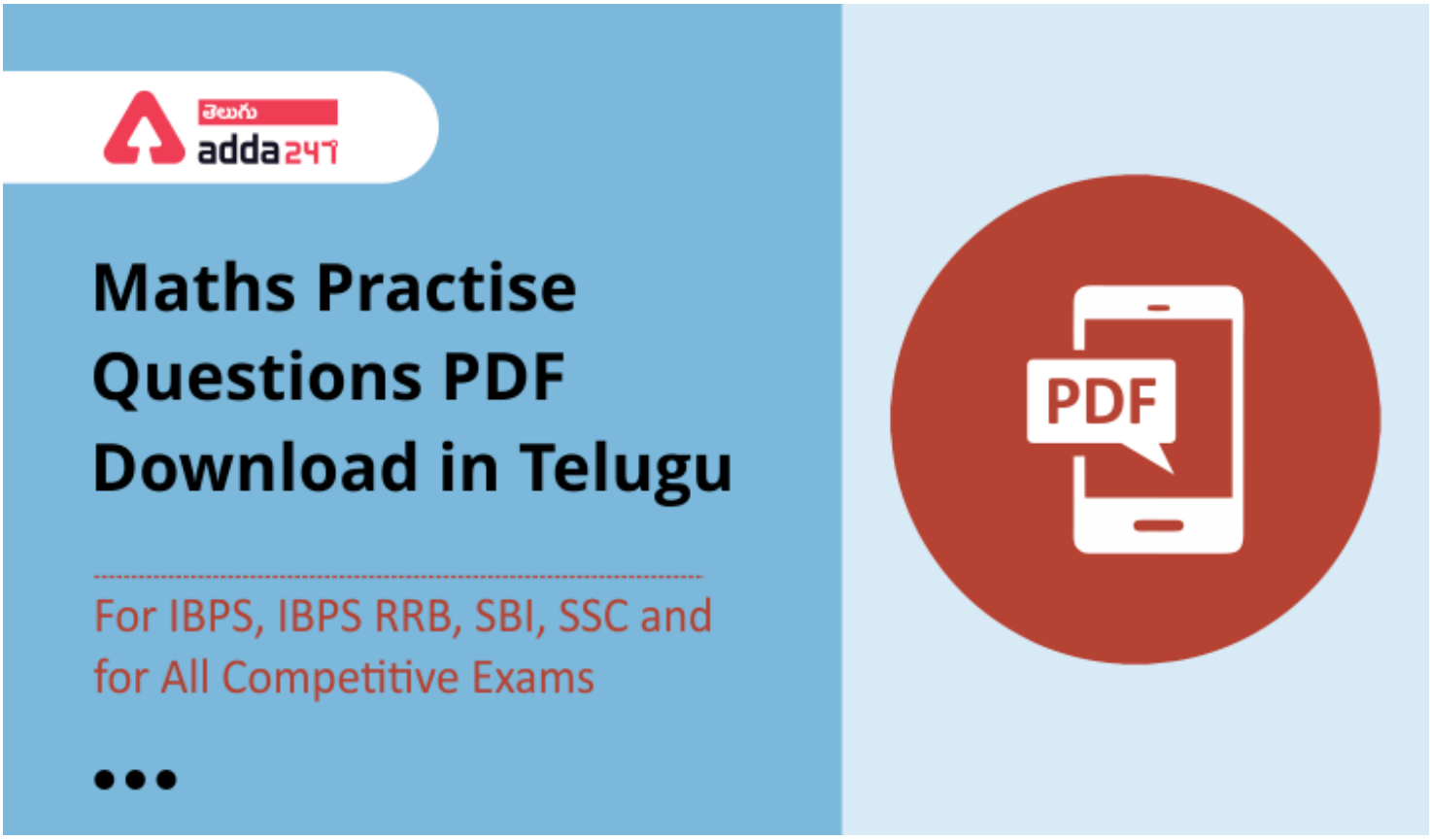
Quantitative Aptitude – Solutions (సమాధానాలు) Set-5



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S1. Ans.(c)
Sol.

9 2

18

6 3

Both puncture together will make it flat in $= \frac{18}{5}$ minutes

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

S2. Ans.(a)
Sol.

Let the work done by each one of A, B & C per day be x, y, z.

$x + y = \frac{1}{12}$

$x = \frac{1}{12} - y$

$y + z = \frac{1}{16}$

$z = \frac{1}{16} - y$

ATQ,

$5x + 7y + 13z = 1$

$\frac{5}{12} - 5y + 7y + \frac{13}{16} - 13y = 1$

$\frac{5}{12}+\frac{13}{16}-1=11y$

$11y=\frac{11}{48}$

y = 1/48

B alone will finish the work in 48 days.

S3. Ans.(a)

Sol. Three sides of triangle = a + b, b + c, c + a

$S=\frac{2(a+b+c)}{2}=a+b+c$

Area = $\sqrt{s(s-x)(s-y)(s-z)}$

$=\sqrt{(a+b+c)\,abc}$

S4. Ans.(a)

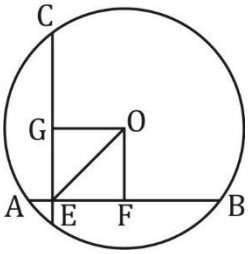
Sol. No. of spheres

$=\frac{\frac{1}{3}\pi(30)^2\times 45}{\frac{4}{3}\pi(5)^3}$

= 81

S5. Ans.(a)

Sol.



AE = 2

EB = 6

ED = 3

AE × EB = CE × ED

2 × 6 = CE × 3

CE = 4 cm

CD = 4 + 3 = 7

EF = AB – FB – AE

= 8 – 4 – 2

= 2

Radius = $\sqrt{\left(\frac{7}{2}\right)^2+(2)^2}$

$=\sqrt{\frac{49}{4}+4}$

$=\frac{1}{2}\sqrt{65}$

Diameter = $\sqrt{65}$

S6. Ans.(a)

Sol. Kites of Rs. 20 is available for Rs. 19

Discount ⇒ 10%

Kites of Rs. 20 is available for Rs. 18

No. of Kites = $\frac{2}{18}\times 27=3$

S7. Ans.(c)

Sol. Total C.P = 1600 + 2400= 4000

S.P after discount = $7800\times\frac{90}{100}=7020$

Profit % = $\frac{3020}{4000}\times 100=75.5\%$

S8. Ans.(c)

Sol. Area of circle = kr^2

Area of smaller circle = 9k

Area of larger circle = 25k

Ratio = (25k – 9k) : 25

= 16k : 25k

= 16 : 25

S9. Ans.(d)

Sol. R + 2 × C = 17 × 3= 51

W + 2C = 16 × 3= 48

W + 51 – R = 48

W + 51 – 33 = 48

W = 30 years

S10. Ans.(a)

Sol. Effective change

$\Rightarrow a + b + \frac{ab}{100}$

Let the other side is decreased by x%

$\Rightarrow 30 - x - \frac{30x}{100} = 0$

$30 - \frac{13x}{10} = 0$

$x = \frac{300}{13} = 23\frac{1}{13}\%$

S11. Ans.(b)

Sol. 40M = 60W = 80C

M = 2C, W = $\frac{4}{3}$C

$10M + 10W + 10C = 20C + \frac{40C}{3} + 10C$

$= \frac{60C + 40C + 30C}{3}$

$= \frac{130C}{3}$

$40 \times 6 = \frac{130}{3} \times$ months

$\frac{78}{13}$ = months

months = 6

S12. Ans.(a)

Sol. Volume of new cube

= 216 + 512 + 1 = 729

Side of new cube = $(729)^{1/3}$

= 9 cm

Surface area of cube

= 6 × $(side)^2$

= 6 × $(9)^2$

= 6 × 81

= 486 cm^2

S13. Ans.(b)

Sol.

$\frac{d}{S_1} = \frac{d}{S_2} = 37$

$\frac{2d}{S_1} = 55$

$\frac{d}{S_1} = \frac{55}{2}$

$\frac{55}{2} + \frac{d}{S_2} = 37$

$\frac{d}{S_2} = 37 - \frac{55}{2}$

$= \frac{74 - 55}{2}$

$= \frac{19}{2}$

$S_2 = \frac{2d}{19}$

$t = \frac{2d}{S_2} = \frac{2d}{\frac{2d}{19}} = 19$ minutes

S14. Ans.(a)

Sol. S.I for 1st year = 1000

C.I for 1st year = 1000

C.I for 2nd year = 2050 – 1000 = 1050

Rate = $\frac{50}{1000} \times 1000$

= 5%

$3000 = \frac{P \times 3 \times 5}{100}$

R = 20000 Rs.

S15. Ans.(c)

Sol. ab + bc + ac = 0

bc = –(ab + ac)

ac = –(ab + bc)

ab = –(bc + ac)

$\frac{1}{a^2 - bc} + \frac{1}{b^2 - ac} + \frac{1}{c^2 - ab}$

$= \frac{1}{a^2 + ab + ac} + \frac{1}{b^2 + ab + bc}$

$= \frac{1}{c^2 + bc + ac}$

$= \frac{1}{a(a+b+c)} + \frac{1}{b(a+b+c)} + \frac{1}{c(a+b+c)}$

$= \frac{1}{(a+b+c)}\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$

$= \frac{1}{(a+b+c)}\left(\frac{bc+ac+ab}{abc}\right)$

= 0

S16. Ans.(c)

Sol. $\frac{S_{20}}{20} = 55$

S_{20} = 1100

S_{18} = 1100 – 45 – 30

= 1100 – 75

= 1025

New Average = $\frac{1025}{18}$

≅ 56.9

S17. Ans.(a)

Sol.

x cosθ – y sin θ = 2 ...(1)

x sinθ + y cosθ = 4 ...(2)

squaring both sides on (1) & (2)

$x^2 \cos^2\theta + y^2 \sin^2\theta - 2xy \cos\theta \sin\theta = 4$

$x^2 \sin^2\theta + y^2 \cos^2\theta + 2xy \sin\theta \cos\theta = 16$

$x^2 (\sin^2\theta + \cos^2\theta) + y^2(\sin^2\theta + \cos^2\theta = 20$

$x^2 + y^2 = 20$

S18. Ans.(b)

Sol. $\frac{1}{\text{cosec}\,\theta - \cot\theta} - \frac{\sin}{\sin\theta}$

$= \frac{\text{cosec}\theta + \cot\theta}{\text{cosec}^2\theta - \cot^2\theta} - \frac{1}{\sin\theta}$

= cosecθ + costθ – cosecθ = cotθ

S19. Ans.(c)

Sol. $\cos^2 - \sin^4 = \frac{2}{3}$

$(\cos^2\theta + \sin^2\theta)(\cos^2\theta - \sin^2\theta) = 2/3$

$\cos^2\theta - \sin^2\theta = \frac{2}{3}$

$1 - \sin^2\theta - \sin^2\theta = \frac{2}{3}$

$1 - 2\sin^2\theta = \frac{2}{3}$

S20. Ans.(a)

Sol. $\frac{sinA}{1sinA} + \frac{sinA}{1-cosA}$

$= \text{sinA}\left[\frac{1-cosA+1+cosA}{1-cos^2A}\right]$

$= \text{sinA}\left[\frac{2}{sin^2A}\right]$

= 2 cosecA

S21. Ans.(a)

Sol.

$x + \frac{1}{x} = 2\cos\theta$

Cubing both sides

$x^3 + \frac{1}{x^3} + 3 \times x \times \frac{1}{x}\left(x + \frac{1}{x}\right) = 8\cos^3\theta$

$x^3 + \frac{1}{x^3} + 6\cos\theta = 8\cos^3\theta$

$x^3 + \frac{1}{x^3} = 8\cos^3\theta - 6\cos\theta$

$x^3 + \frac{1}{x^3} = 2(4\cos^3\theta - 3\cos\theta)$

= 2cos 3θ

S22. Ans.(a)

Sol.

$\tan\theta = \sqrt{6+\sqrt{6+\sqrt{6+.....\infty}}}$

$\sqrt{6+\sqrt{6+\sqrt{6+.....\infty}}} = 3\ (6 = 3 \times 2)$

$\tan\theta = 3$

$\sec^2\theta = 1 + \tan^2\theta$

$= 1 + 9$

$= 10$

S23. Ans.(c)

Sol.

$\tan\theta = 1/2$

$\tan\phi = 1/3$

$\tan(\theta+\phi) = \dfrac{\tan\theta+\tan\phi}{1-\tan\theta\tan\phi}$

$= \dfrac{\frac{1}{2}+\frac{1}{3}}{1-\frac{1}{2}\times\frac{1}{3}}$

$= \dfrac{\frac{3+2}{6}}{\frac{6-1}{6}}$

$\tan(\theta+\phi) = 1$

$\tan(\theta+\phi) = \tan 45°$

$\theta+\phi = 45° = \pi/4$

S24. Ans.(c)

Sol.

$\dfrac{\sin\theta+\cos\theta}{\sin\theta-\cos\theta} = 3$

$\sin\theta + \cos\theta = 3\sin\theta - 3\cos\theta$

$4\cos\theta = 2\sin\theta$

$\tan\theta = \dfrac{2 \to P}{1 \to B}$

$H = \sqrt{4+1} = \sqrt{5}$

$\sin^4\theta - \cos^4\theta = \left(\frac{P}{H}\right)^4 - \left(\frac{B}{H}\right)^4$

$= \dfrac{16}{25} - \dfrac{1}{25}$

$= \dfrac{15}{25} = \dfrac{3}{5}$

S25. Ans.(d)

Sol.

$\sin 17° = \dfrac{x \to P}{y \to H}$

$B = \sqrt{y^2 - x^2}$

$\sec 17° = \dfrac{H}{B} = \dfrac{y}{\sqrt{y^2-x^2}}$

$\sin 73° = \dfrac{P}{H} = \dfrac{\sqrt{y^2-x^2}}{y}$

$\text{Sec } 17° - \sin 73°$

$= \dfrac{y}{\sqrt{y^2-x^2}} - \dfrac{\sqrt{y^2-x^2}}{y}$

$= \dfrac{y^2 - y^2 + x^2}{y\sqrt{y^2-x^2}}$

$= \dfrac{x^2}{y\sqrt{y^2-x^2}}$

S26. Ans.(b)

Sol.

$\sin\theta + \cos\theta = p$

$\sec\theta + \text{cosec}\,\theta = q$

$q\,(p^2 - 1)$

$= (\sec\theta + \text{cosec}\,\theta)\ (\sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta - 1$

$= (\sec\theta + \text{cosec}\,\theta)\ (2\sin\theta\cos\theta)$

$= 2\sin\theta + 2\cos\theta$

$= 2p$

S27. Ans.(c)

Sol.

$\sin(x+y) = \cos(x-y)$

$\sin(x+y) = \sin[90 - (x-y)]$

$x + y = 90 - x + y$

$2x = 90$

$x = 45°$

$\cos^2 x = \cos^2 45° = \left(\frac{1}{\sqrt{2}}\right)^2 = \frac{1}{2}$

S28. Ans.(a)

Sol.

$3 \sin 20° - 4\sin^3 20°$

$3 \sin \theta - 4 \sin^3 \theta = \sin 3\theta$

$3\sin 20° - 4\sin^3 20°$

$= \sin 3 \times 20°$

$= \sin 60°$

$= \sqrt{3}/2$

S29. Ans.(b)

Sol.

$$\frac{\sin\theta}{\cot\theta + \operatorname{cosec}\theta} - \frac{\sin\theta}{\cot\theta - \operatorname{cosec}\theta}$$

$$= \frac{\cos\theta - 1 - \cos\theta - 1}{\cot^2\theta - \operatorname{cosec}^2\theta}$$

$$= \frac{-2}{\cot^2\theta - \operatorname{cosec}^2\theta}$$

$$= \frac{-2}{-(\operatorname{cosec}^2\theta - \cot^2\theta)}$$

$= 2$

S30. Ans.(b)

Sol.

$2 (\sin^6\theta + \cos^6\theta) - 3 (\sin^4\theta + \cos^4\theta) + 1$

$= 2 (1 - 3\sin^2\theta \cos^2\theta) - 3 (1 - 2\sin^2\theta \cos^2\theta) +$

$= 2 - 6\sin^2\theta\cos^2\theta - 3 + 6\sin^2\theta\cos^2\theta + 1$

$= 2 - 3 + 1 = 0$

S31. Ans.(a)

Sol. First polynomial = $6x^3 + 60x^2 + 150x$

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

Second polynomial = $3x^4 + 12x^3 - 15x^2$

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

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

S32. Ans.(b)

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

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

$\therefore k = \pm 3$

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

Hence value of k is 3.

S33. Ans.(a)

Sol. Required remainder = $3 (2y)^3 - 2 (2y)^2 y - 13 (2y)$

$y^2 + 10y^3$ (using factor theorem)

$= 24y^3 - 8y^3 - 26y^3 + 10y^3 = 34y^3 - 34y^3 = 0$

S34. Ans.(d)

Sol. Let the numbers be x and y

$2x + 3y = 36$

$3x + 2y = 39$

$4x + 6y = 72$

$$\frac{9x + 6y = 117}{5x = 45}$$

∴ x = 9

2 × 9 + 3y = 36

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

∴ Smaller number is 6

S35. Ans.(d)

Sol. Let x and y be the numbers,

∴ x + y = 20, x − y = 80

⇒ x = 14, y = 6

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

= (14 + 6) (14 − 6) ⇒ 20 × 8 = 160

S36. Ans.(d)

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

S37. Ans.(b)

Sol. The number is 68 × 269 = 18292. 18292, when divided by 67, leaves a remainder of 1.

S38. 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.

S39. 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

S40. Ans.(a)

Sol.

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

20	21
20	21
20	21
20	21
160000	$(21)^4$

160000r → 160000

1r → 1

$(21)^4$r → 194481

S41. Ans.(c)

Let CP → 100

$MP = 100 \times \frac{140}{100} = 140$

$SP = 140 \times \frac{90}{100} = 126$

Profit = 126 – 100 = 26r

Actual profit = $468 \times \frac{100}{90} = 520$ Rs

26r → 520 Rs

1r → 20 Rs

Sol. 100r → 2000 Rs

S42. Ans.(a)

MP of 15 chairs= 15 × 300 = 4500 Rs

SP of 15 chairs = 12 × 300 + 3 × 225

= 3600 + 675= 4275

Discount = 4500 – 4275= 225

Sol. Discount % = $\frac{225}{4500} \times 100 = 5\%$

S43. Ans.(a)

$\frac{800 \times r \times 2}{100} - \frac{400 \times 2 \times r}{100} = 40$

16r -8r = 40

Sol. r = 5%

S44. Ans.(a)

Speed of Abhay → a

Speed of Sameer → s

$\frac{30}{a} - \frac{30}{s} = 2$

$\frac{30}{s} - \frac{30}{2a} = 1$

$\frac{30}{a} - 2 - \frac{30}{2a} = 1$

$\frac{60 - 30}{2a} = 3$

10 = 2a

Sol. a = 5 km/hr

S45. Ans.(c)

$2^x = 4^y = 8^z$

$2^x = 2^{2y}$

x = 2y

$2^{2y} - 2^{3z}$

2y = 3z

$y = \frac{3}{2}z$

$x = 2 \times \frac{3}{2}z$

= 3z

xyz = 288

$3z \times \frac{3}{2}z \times z = 288$

$z^3 = 32 \times 2$

$z^3 = 64$

z = 4

x = 3z = 4 × 3= 12

$y = \frac{3}{2} \times 4 = 6$

$\frac{1}{2x} + \frac{1}{4y} + \frac{1}{8z}$

$\frac{1}{2 \times 4} + \frac{1}{4 \times 6} + \frac{1}{8 \times 4}$

$= \frac{1}{8} + \frac{1}{24} + \frac{1}{32}$

$= \frac{12 + 4 + 3}{96}$

Sol. $= \frac{19}{96}$

S46. Ans.(a)

$\frac{4}{3}\pi R^3 = \frac{1}{3}\pi r^2 \times 2r + \pi r^2 \times 2r$

$\frac{4}{3}\pi R^3 = \frac{2}{3}\pi r^3 + 2\pi r^3$

$4R^3 = 8r^3$

$R^3 = 2r^3$

Sol. $R = 2^{\frac{1}{3}} r$

S47. Ans.(a)

Sol.

Area of rhombus $= \frac{1}{2} d_1 \times d_2$

$d_1 : d_2 = 2 : 5$

$d_1 = 2x$

$d_2 = 5x$

Area of square on shorter diagonal $= (2x)^2 = 4$

Area of rhombus $= \frac{1}{2} \times d_1 \times d_2 = \frac{1}{2} \times 2x \times 5x =$

Ratio $= 5x^2 : 4x^2$

$= 5 : 4$

S48. Ans.(b)

$3x + 2y = 11$

$Kx + 4y = 22$

Condition of confident lines

$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

$\frac{3}{k} = \frac{2}{4}$

Sol. $K = 6$

S49. Ans.(b)

Let the bought 60 oranges

Price of 60 oranges at 20 to Rs 60

$= 60 \times 3$

$= 180$ Rs

Price of 60 oranges at 30 for Rs 60

$= 60 \times 2$

$= 120$ Rs

Total CP = 180 + 120

$= 300$ Rs

SP of 120 oranges

$= \frac{60}{25} \times 120$

$= 288$ Rs

Loss % $= \frac{12}{300} \times 100$

Sol. $= 4\%$

S50. Ans.(d)

Sol.

Work done by (P + Q + R) = 1 ....(i)

Work done by $(P + Q) = \frac{19}{23}$ ....(ii)

Work done by $(Q + R) = \frac{8}{23}$ ...(iii)

From (i) + (iii) – (i) –

$Q = \frac{19}{23} + \frac{8}{23} - 1 = \frac{4}{23}$

work of $Q = \frac{4}{23} \times 5750 = 1000$

ఉచిత స్టడీ మెటీరియల్ పొందండి:

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