SSC TIER II (MATHS) MOCK TEST - 39 (SOLUTION)

1. (B) A.T.Q,
Time taken by first runner
$= \frac{2000}{20} = 100$ sec
Time taken by second runner
$= \frac{2000}{25} = 80$ sec
Time taken by third runner
$= \frac{2000}{40} = 50$ sec
$\therefore$ Required time
= L.C.M of 100, 80 and 50 = 400 sec

2. (C) A.T.Q,
$\therefore$ Required H.C.F = $a^3 b^4 c^5$

3. (C) A.T.Q,
$\frac{8^{14} \times 45^{38} \times 12^{18}}{8^{12} \times 5^{22}} = 2^6 \times 5^{16} \times 3^{76} \times 2^{36} \times 3^{18}$
$\therefore$ Number of prime factor
$= 6 + 16 + 76 + 36 + 18 = 152$

4. (D) Let two consecutive numbers are 5 and 3
A.T.Q,
$5^2 - 3^2 = (5 - 3)(5 + 3) = 16$
Hence, it is always divisible by 8.

5. (A) Let average age of 30 students = x years
A.T.Q,
$30x + 159 = 33(x + 3)$
$\Rightarrow 3x = 60$
$\Rightarrow x = 20$
$\therefore$ Average age of 33 students = 23 years

6. (C) A.T.Q,
Total age of Vinay and his wife at the time of marriage = 27 + 24 = 51 years
Total present age of Vinay, his wife and his son = 23 × 3 = 69 years
Hence, present age of the son
= 69 – 51 – 12 = 6 years

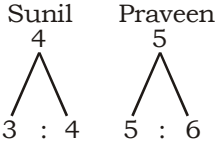
7. (B) Let x be the number of students in least row.
So, through opitons B,
$x + x + 3 + x + 6 + x + 9 + x + 12 + x + 15 = 630$
$\Rightarrow 6x = 630 - 45$
$\Rightarrow x = 97.5$
$\therefore$ 6 can not be the number of rows.

8. (C) A.T.Q,
Total age of A, B and C
$= \frac{(22 \times 2 + 21 \times 2 + 24 \times 2)}{2} = 67$
$\therefore$ Ages of A, B and C
= (67 – 21 × 2), (67 – 24 × 2) and (67 – 22 × 2)
= 25, 19, 23 years

9. (D) A.T.Q,
Total score after 59 innings (58 × 58) + 117
= 3481 runs
$\therefore$ Average of 59 innings $= \frac{3481}{59} = 59$ runs
Runs scored in 60th innings
= (60 × 61) – 3481 = 179

10. (B) Let the average expenditure = ₹x
$44x + 34.5 = 50(x - 1.5)$
$\Rightarrow 44x + 34.5 = 50x - 75$
$\Rightarrow 6x = 109.5$
$\therefore$ Original expenditure
$= \frac{109.5}{6} \times 44 =$ ₹803

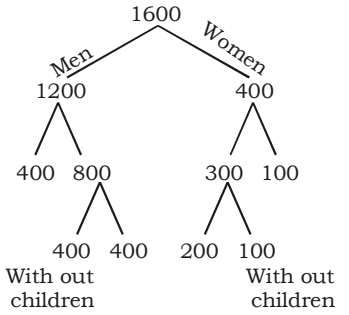
11. (B) A.T.Q,



Ratio of the previous year income
$= \frac{4}{4} \times 3 : \frac{5}{6} \times 5 = 18 : 25$
Previous year income of sunil
$= \frac{21500}{43} \times 18 =$ ₹9000

12. (D) Let the price of T.V. = ₹x
A.T.Q,
$\frac{4000 + x}{12} = \frac{2700 + x}{9}$
$\Rightarrow 4x - 3x = 12000 - 10800$
$\Rightarrow x =$ ₹1200
$\therefore$ Price of T.V. = ₹1200

13. (B) A.T.Q,
Let total number of workers = 1600



$\therefore$ Required fraction = $\frac{1000}{1600} = \frac{5}{8}$

14. (A) A.T.Q,

$60^2 - 59^2 = (60 - 59)(60 + 59)$

Value of the expression = sum of numbers from 31 to 60

Required value

$= \frac{60 \times 61}{2} - \frac{30 \times 31}{2} = 1365$

15. (B) Let the numbers are $(a - d)$, a and $(a + d)$

A.T.Q,

$42 = a + d + a + a - d$

$\Rightarrow 3a = 42$

$\Rightarrow a = 14$

and, $2730 = (a + d)(a)(a - d)$

$\Rightarrow 196 - d^2 = 195$

$\Rightarrow d = 1$

$\Rightarrow d = 1$

$\therefore$ Smallest number = 14 – 1 = 13

16. (A) A.T.Q,

$\frac{16x + 6}{3x - 2} = \frac{27}{5}$

$\Rightarrow 80x + 30 = 81x - 54$

$\Rightarrow x = 84$

$\therefore$ Total number of appeared students

$= 84 \times 16 = 1344$

17. (D) A.T.Q,

Ist	:	2nd	:	3rd
6	:	7		
		4	:	5
24	:	28	:	35

Now,

$24x \times 35x = 7560$

$\Rightarrow x^2 = 9$

$\Rightarrow x = 3$

$\therefore$ Required sum = 3(24 + 28 + 35) = 261

18. (C) Let B takes x days to finish the work and A takes $x + 8$ days to finish the work.

A.T.Q,

$\frac{3(x+8)}{4} = \frac{x}{4} + 9$

$\Rightarrow 3x + 24 = x + 36$

$\Rightarrow 2x = 12$

$\Rightarrow x = 6$

$\therefore$ Time taken by A = 8 + 6 = 14 days

19. (A) Let time taken by first and second are a days and b days respectively.

A.T.Q,

$\frac{1}{a} + \frac{1}{b} = \frac{1}{9}$

$\Rightarrow 9(a + b) = ab$ ..... (i)

and,

$\frac{1}{2a} + \frac{2}{b} = \frac{1}{6}$

$\Rightarrow 6b + 24a = 2ab$ ..... (ii)

Solving equation (i) and (ii), we get

$6b + 24a = 2[9(a + b)]$

$\Rightarrow 6a = 12b$

$\Rightarrow a = 2b$

$6b + 24(2b) = 2ab$

$\Rightarrow 54b = 2ab$

$\Rightarrow a = 27$

$\therefore$ Required number of days = 27 days

20. (B) Let P works for x days

$\frac{32}{x} + \frac{68}{8 - x} = 25$ (Per day work)

On solving, we get

$\Rightarrow x = 4$

$\therefore$ One day work of A = 8

$\therefore$ Required number of days = $\frac{192}{8}$

= 24 days

21. (C) A.T.Q,

Pipe A $\rightarrow$ 16 — 6
Pipe B $\rightarrow$ 24 — 4 — 96
Pipe C $\rightarrow$ 32 — 3

Work done by pipe B and C in 6 minutes = 42 units

Work done by pipe A in 4 minutes = 24 units

$= \frac{96 - 42 - 24}{6 + 3} = \frac{30}{9} = \frac{10}{3}$ min

Total time taken to fill the tank

$= 6 + 4 + \frac{10}{3} = 13\frac{1}{3}$ min

22. (C) Let they work together for x days

A.T.Q,

One day work of B and C = $\frac{1}{p}$

and,

One day work of A and B = $\frac{1}{q}$

One day work of A, B and C

$= \frac{1}{p} + \frac{1}{q} - \frac{1}{2x}$

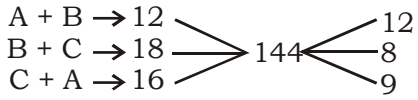
Now,

$\frac{1}{p} + \frac{1}{q} - \frac{1}{2x} = \frac{1}{x}$

$\Rightarrow \frac{q+p}{pq} = \frac{3}{2x}$

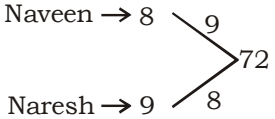
$\Rightarrow x = \frac{3pq}{2(p+q)}$

23. (A) A.T.Q,



$\therefore$ Required of time $= \frac{144 \times 2}{29} = 9\frac{27}{29}$ days

24. (B) A.T.Q,



$\therefore$ Efficiency of Nitin $= \frac{72-(9+8)3}{7} = 3$

Ratio of efficiency = 9 : 8 : 3
Ratio of time = 3 : 3 : 7
Ratio of wages = 27 : 24 : 21
= 9 : 8 : 7

$\therefore$ Share of Naveen $= \frac{7200}{24} \times 9 = ₹2700$

Share of Naresh $= \frac{7200}{24} \times 8 = ₹2400$

and,

Share of Nitin $= \frac{7200}{24} \times 7 = ₹2100$

25. (D) A.T.Q,

$4M + 6W + 9C = \frac{17600}{11} = 1600$ ..... (i)

$5M + 4W + 6C = \frac{8460}{6} = 1410$ ..... (ii)

Solving equation (i) and (ii), we get
$9M + 10W + 15C = 3010$ ..... (iii)
and,

$3M + 3W + 8C = \frac{16020}{9} = 1780$.... (iv)

On solving equation (iii) and (iv), we get
$6M + 7W + 7C = 1230$
$\therefore$ Required amount = $1230 \times 9 = ₹11070$

26. (C) A.T.Q,

$x + \frac{15}{x} = 8$ ..... (i)

$\Rightarrow x^2 + 15 - 8x = 0$

$\Rightarrow x^2 - 5x - 3x + 15 = 0$
$\Rightarrow (x-5)(x-3) = 0$
$\Rightarrow x = 5$ and $x = 3$
Now,

$x^2 + \frac{15}{x^2} = (5)^2 + \frac{15}{(5)^2} = 25 + \frac{3}{5}$

$\Rightarrow x^2 + \frac{15}{x^2} = \frac{128}{5}$

27. (B) A.T.Q,

$\frac{5\sqrt{3}+6\sqrt{2}}{\sqrt{75}+\sqrt{32}} = a + b\sqrt{6}$

$\Rightarrow \frac{5\sqrt{3}+6\sqrt{2}}{5\sqrt{3}+4\sqrt{2}} \times \frac{5\sqrt{3}-4\sqrt{2}}{5\sqrt{3}-4\sqrt{2}} = a + b\sqrt{6}$

$\Rightarrow \frac{75+30\sqrt{6}-20\sqrt{6}-48}{75-32} = a + b\sqrt{6}$

$\Rightarrow a + b\sqrt{6} = \frac{27+10\sqrt{6}}{43}$

$\Rightarrow a = \frac{27}{43}$ and B $= \frac{10}{43}$

28. (C) A.T.Q,

$\frac{1}{x} = \frac{p+q}{pq}$, $\frac{1}{y} = \frac{p+r}{pr}$ and $\frac{1}{z} = \frac{q+r}{qr}$

Now, $\frac{1}{x} + \frac{1}{y} - \frac{1}{z} = \frac{p+q}{pq} + \frac{p+r}{pr} - \frac{q+r}{qr}$

$\Rightarrow \frac{yz+xz-xy}{xyz} = \frac{pr+qr+pq+rq-pq-pr}{pqr}$

$\Rightarrow \frac{yz+xz-xy}{xyz} = \frac{2}{p}$

$\Rightarrow p = \frac{2xyz}{yz+xz-xy}$

29. (B) A.T.Q,

$\frac{5x^2-6x+5}{x^2-x+1} = \frac{5x-6+\frac{5}{x}}{x-1+\frac{1}{x}}$

Now, $x - \frac{1}{x} = \sqrt{5}$

$\Rightarrow x^2 + \frac{1}{x^2} = 7$

$\Rightarrow \left(x + \frac{1}{x}\right)^2 = 9$

$\Rightarrow x + \frac{1}{x} = 3$

$\therefore \frac{5x^2-6x+5}{x^2-x+1} = \frac{15-6}{3-1} = \frac{9}{2}$

30. (C) A.T.Q,

$a^2 - b^2 = x$

$b^2 - c^2 = y$

and, $c^2 - a^2 = z$

Now,

$x + y + z = a^2 - b^2 + b^2 - c^2 + c^2 - a^2 = 0$

$\therefore (a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3$

$= 3(a^2 - b^2)(b^2 - c^2)(c^2 - a^2)$

$\Rightarrow 3(a-b)(a+b)(b-c)(b+c)(c+a)(c-a)$

31. (B) A.T.Q,

$$\left[\left(1+\frac{1}{5+\frac{1}{5}}\right)\left(1+\frac{1}{5+\frac{1}{5}}\right)-\left(1-\frac{1}{5+\frac{1}{5}}\right)\right]$$

$$=\left[\left(1+\frac{5}{26}\right)\left(1+\frac{5}{26}\right)-\left(1-\frac{5}{26}\right)\right]$$

$$=\left[\left(\frac{31}{26}\right)\left(\frac{31}{26}\right)-\frac{21}{26}\right]$$

$$=\frac{961}{676}-\frac{21}{26}$$

$$=\frac{961-546}{676}=\frac{415}{676}$$

32. (C) A.T.Q,

$(3a - 1)^2 + (6b - 5)^2 + (6c + 1)^2 = 0$

$\Rightarrow a = \frac{1}{3}$

$\Rightarrow b = \frac{5}{6}$

$\Rightarrow c = \frac{-1}{6}$

Now,

$$\frac{a^3+b^3+c^3-3abc}{a^2+b^2+c^2}$$

$$=\frac{\frac{1}{2}(a+b+c)\left[(a-b)^2(b-c)^2(c-a)^2\right]}{a^2+b^2+c^2}$$

$$=\frac{\frac{1}{2}\left(\frac{2+5-1}{6}\right)\left(\frac{1}{4}\times1\times\frac{1}{4}\right)}{\frac{1}{9}+\frac{25}{36}+\frac{1}{36}}$$

$$=\frac{\frac{1}{2}\times1\times\frac{1}{16}}{\frac{30}{36}}=\frac{3}{80}$$

33. (B) A.T.Q,

$A = 2 \times 2 \times 2 (x + 1)^2 (x + 2)(x + 6)$

$B = 2 \times 2 \times 5 (x + 1)(x + 2)(x + 2)(x + 7)$

$\therefore$ L.C.M of the polynonimals

$= 40 (x + 1)^2 (x + 2)^2 (x + 6)(x + 7)$

34. (C) A.T.Q,

$$\sqrt{\frac{x}{y}}+\sqrt{\frac{y}{x}}=\frac{12}{5}$$

$$\Rightarrow \frac{x}{y}+\frac{y}{x}+2=\frac{144}{25}$$

$$\Rightarrow x^2+y^2+2xy=\frac{144}{25}xy$$

Now,

$(x + y)^2 = (12)^2$

$\Rightarrow x^2 + y^2 + 2xy = 144$

$$\therefore \frac{144}{25}xy = 144$$

$\Rightarrow xy = 25$

35. (D) A.T.Q,

$ax + by = 8$ ..... (i)

$bx - ay = 4$ ..... (ii)

Squaring and adding equation (i) and (ii), we get

$a^2x^2 + b^2y^2 + a^2y^2 + b^2x^2 = 80$

$\Rightarrow x^2(a^2 + b^2) + y^2(a^2 + b^2) = 80$

$\Rightarrow (x^2 + y^2)(a^2 + b^2) = 80$

$\Rightarrow x^2 + y^2 = 10$

36. (D) A.T.Q,

Required number of books

$$= 8200 \times \frac{15}{100} \times \frac{3}{5} = 738$$

37. (A) A.T.Q,

Required ratio

$$= 8200 \times \frac{21}{100} \times \frac{3}{7} : 8200 \times \frac{18}{100} \times \frac{5}{6}$$

$= 3 : 5$

38. (C) A.TQ,

Required number of books

$$= 8200\left[\frac{21}{100}\times\frac{4}{7}+\frac{18}{100}\times\frac{5}{6}+\frac{15}{100}\times\frac{3}{5}+\frac{10}{100}\times\frac{3}{10}+\frac{36}{100}\times\frac{7}{9}\right]$$

$= 5494$

39. (A) A.T.Q,

Required ratio = 5494 : (8200 – 5494)

= 2747 : 1353

40. (B) A.T.Q,

Required number of books

$= 8200 \times \frac{15}{100} + 8200 \times \frac{10}{100}$

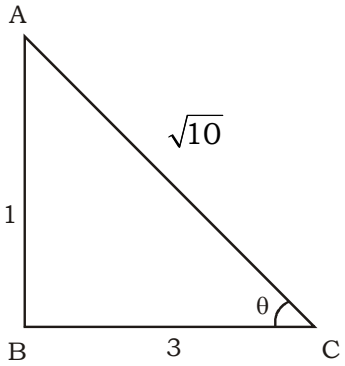
$= 1230 + 820 = 2050$

41. (C) A.T.Q,

$\frac{r_1}{r_2} = \frac{l_1}{l_2} \times \frac{\theta_2}{\theta_2}$

$\therefore$ Required ratio = 75° : 45° = 5 : 3

42. (C) A.T.Q,



$\therefore \frac{\text{cosec}^2\theta + \sec^2\theta}{\text{cosec}^2\theta - \sec^2\theta}$

$= \frac{\left(\sqrt{10}\right)^2 + \left(\frac{\sqrt{10}}{3}\right)^2}{\left(\sqrt{10}\right)^2 - \left(\frac{\sqrt{10}}{3}\right)^2} = \frac{10 + \frac{10}{9}}{10 - \frac{10}{9}} = \frac{5}{4}$

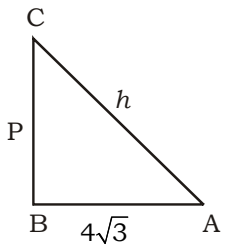
43. (A) A.T.Q,

$\frac{1}{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{2} - \frac{1}{\sqrt{3}} \times 2 + \frac{5 \times 1}{12 \times 1}$

$= \frac{1}{4\sqrt{2}} - \frac{2}{\sqrt{3}} + \frac{5}{12}$

$= \frac{3\sqrt{2} - 16\sqrt{3} + 10}{24}$

44. (B)



AC – BC = 4

$\Rightarrow h$ – P = 4 ..... (i)

$\Rightarrow h^2 = \left(4\sqrt{3}\right)^2 + P^2$

$\Rightarrow h^2 - P^2 = 48$

$\Rightarrow (h + P)(h - P) = 48$

$\Rightarrow h + P = 12$ ..... (ii)

Solving equation (i) and (ii)

$\Rightarrow h = 8$ and P = 4

$\text{cosec C} + \cot C = \frac{8}{4\sqrt{3}} + \frac{4}{4\sqrt{3}} = \frac{12}{4\sqrt{3}} = \sqrt{3}$ cm

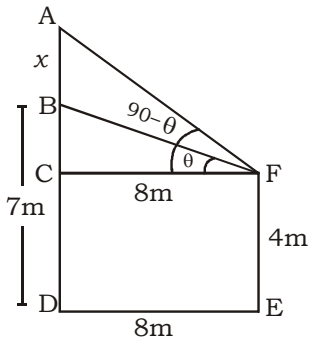
45. (A) A.T.Q,

$680 = 17^1 \times 2^3 \times 5^1$

sum of factor $= \frac{\left(17^2 - 1\right)}{17 - 1} \times \frac{2^4 - 1}{2 - 1} \times \frac{5^2 - 1}{5 - 1}$

$= \frac{18 \times 16}{16} \times \frac{15}{1} \times \frac{24}{4} = 1620$

46. (A) A.T.Q,



In ΔBCF,

$\frac{BC}{CF} = \tan\theta$

$\Rightarrow \frac{3}{8} = \tan\theta$ ..... (i)

In ΔACF,

$\frac{AC}{CF} = \tan(90° - \theta)$

$\Rightarrow \frac{x + 3}{8} = \cot\theta$ ..... (i)

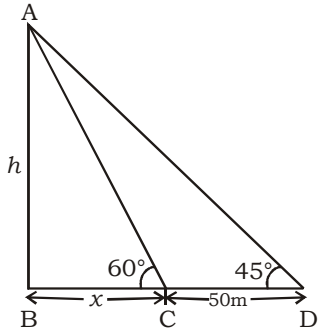
Solving equation (i) and (ii), we get

$\frac{3}{8} \times \frac{(x + 3)}{8} = 1$

$\Rightarrow 3x + 9 = 64$

$\Rightarrow x = 18.33$ m

47. (C) A.T.Q,



In ΔABC,

$\frac{AB}{BC} = \tan 60°$

$\Rightarrow \frac{h}{x} = \sqrt{3}$

In ΔABD,

$\frac{AB}{BD} = \tan 45°$

$= \frac{h}{x+50} = 1$ ..... (i)

From equation (i) and (ii), we get

$\Rightarrow x + 50 = \sqrt{3}\,x$

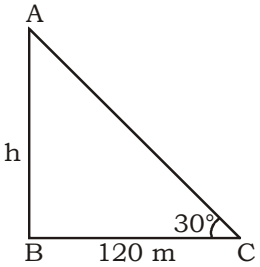
$\Rightarrow x = \frac{50}{\sqrt{3}-1}$

$\Rightarrow x = 25\left(\sqrt{3}+1\right)$ m

$\therefore h = \sqrt{3} \times 25\left(\sqrt{3}+1\right)$ m

$\therefore$ Height of tower $= 25\left(\sqrt{3}+3\right)$ m

48. (C) A.T.Q,



In ΔPQR,

$\frac{h}{120} = \frac{1}{\sqrt{3}}$

$\Rightarrow h = 40\sqrt{3}\,m$

$\therefore$ Speed of the ballon

$= \frac{40\sqrt{3}}{10} = 4 \times 1.73$

= 6.92 meter/ Min.

49. (B) A.T.Q,

$\sin\theta - \cos\theta = \sqrt{2}\cos\theta$

$\Rightarrow \sin\theta = \cos\theta + \sqrt{2}\cos\theta$

$\Rightarrow \cos\theta = \frac{\sin\theta}{\sqrt{2}+1}$

$\Rightarrow \cos\theta = \left(\sqrt{2}-1\right)\sin\theta$

$\therefore \sin\theta + \cos\theta = \sqrt{2}\sin\theta$

50. (C) A.T.Q,

$\sin 2\theta + \sin\theta = 6\cos\theta + 3$

$\Rightarrow 2\sin\theta\cos\theta + \sin\theta = 6\cos\theta + 3$

$\Rightarrow 2\sin\theta\cos\theta + \sin\theta - 6\cos\theta - 3 = 0$

$\Rightarrow \sin\theta(2\cos\theta + 1) - 3(2\cos\theta + 1) = 0$

$\Rightarrow (\sin\theta - 3)(2\cos\theta + 1) = 0$

$\Rightarrow (\sin\theta - 3)(2\sin\theta + 1) = 0$

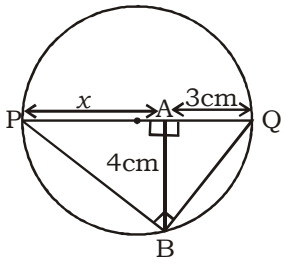
$\Rightarrow \sin\theta = 3$ or $-\frac{1}{2}$

51. (B) A.T.Q,

Area of triangle is maximum, when triangle is right angled

$\therefore$ Third side $= \sqrt{6^2 + 8^2} = 10$cm

52. (D) A.T.Q,



In ΔBAQ,

$BQ^2 = 3^2 + 4^2$

$\Rightarrow BQ = 5$ cm

$\angle PBQ = 90°$ ($\because$ angle of segment)

$\Delta QBP \sim \Delta QAB$

$\therefore \frac{x+3}{5} = \frac{5}{3}$

$\Rightarrow 3x + 9 = 25$

$\Rightarrow x = \frac{16}{3}$cm

$\therefore$ Radius of circle $= \frac{\frac{16}{3}+3}{2} = \frac{25}{6}$ cm,

$\therefore$ Circumference of the circle

$= 2\pi r = 2 \times \pi \times \frac{25}{6} = \frac{25}{3}\pi$ cm

53. (A) A.T.Q,

Circumference (R) $= \frac{H}{2}$

H = 7 × 2 = 14 cm

and,

In radius (r) $= \frac{P+B-H}{2}$

$\Rightarrow$ H = 7 × 2 = 14 cm

and, In radius (r) $= \frac{P+B-H}{2}$

$\Rightarrow P + B = 4 + 14 = 18$ cm

Now,

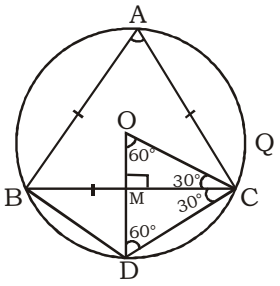
$P^2 + B^2 + 2PB = 324$

$\Rightarrow 2PB = 324 - 196$

$\Rightarrow PB = 64$

$\therefore$ Area of triangle $= \frac{1}{2} \times 64 = 32$ cm^2

54. (C) A.T.Q,



$\Rightarrow \cos 30° = \frac{MC}{OC}$

$\Rightarrow MC = 3$ cm

and, $BC = 6$ cm

$\therefore AB = BC = AC = 6$ cm

In ODC

$\angle DOC = \angle DCO = \angle CDO = 60°$

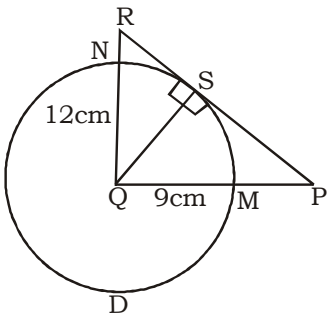
$\therefore CD = 2\sqrt{3}$ cm

$\therefore$ Perimeter of ABDC

$= 6 + 6 + 2\sqrt{3} + 2\sqrt{3}$

$= 12 + 4\sqrt{3} = 4\left(3 + \sqrt{3}\right)$ cm

55. (C) A.T.Q,



Area of triangle PQR

$= \frac{1}{2} \times RQ \times QP = \frac{1}{2} \times PR \times QS$

$\Rightarrow \frac{1}{2} \times 12 \times 9 = \frac{1}{2} \times QS \times 15$

$\Rightarrow QS = 7.2$cm

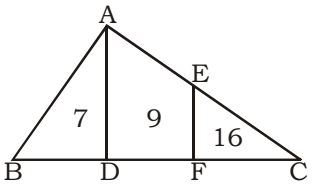
$PM = 9 - 7.2 = 1.8$ cm

and,

$NR = 12 - 7.2 = 4.8$ cm

$\therefore$ Required ratio $= 18 : 48 = 3 : 8$

56. (A) A.T.Q,



$\Delta ADC \sim \Delta EFC$

$\frac{\text{area of } \Delta ADC}{\text{area of } \Delta EFC} = \left(\frac{AD}{EF}\right)^2$

$\Rightarrow \frac{25}{16} = \frac{AD}{EF}$

$\Rightarrow \frac{AD}{EF} = \frac{5}{4}$

$\Rightarrow EF = \frac{4 \times 2.5}{5} = 2$ cm

57. (B) A.T.Q,

$\frac{(20)^{528}}{19}$

Required remainder $= (1)^{528} = 1$

58. (C) Let the number of x

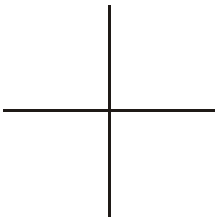
$\frac{x \times x \times 50}{3 \times 100} = 12696$

$\Rightarrow x = 276$

$\therefore$ Required number $= 276$

59. (A) A.T.Q,

$6x - 8y - 72 = 0$



$\therefore$ Required length $= \sqrt{\left(\frac{-c}{a}\right)^2 + \left(\frac{-c}{b}\right)^2}$

$= \sqrt{144 + 81} = \sqrt{225} = 15$ units

60. (B) Let a, b and c are three sides of triangle

$a \leq B \leq C$

A.T.Q,

$a = 2$, side of possible triangle = 2, 5, 5

$a = 3$, side of possible triangle = 3, 4, 5

$a = 4$, side of possible triangle = 4, 4, 4

$\therefore$ Required numbers of triangle = 3

61. (A) A.T.Q,

$$A = \frac{450\times 96}{100} = 432$$

$$\therefore \frac{450\times(100-x)\times(100+x)}{100\times 100} = 432$$

$\Rightarrow (100^2 - x^2) = 9600$

$\Rightarrow x^2 = 400$

$\Rightarrow x = 20$

62. (B) Let the two digit number = $10a + b$

A.T.Q,

$10a + b = x \times 0.40$ ..... (i)

and,

$10b + a = x \times 1.40$ ..... (ii)

Solving equation (i) and (ii), we get,

$9(b - a) = x$

$\therefore$ x will be multiple of 9.

and,

$$\Rightarrow 10a + b = \frac{x\times 40}{100}$$

$\therefore$ x will be multiple of 5.

$\therefore$ Required value of $x = 45$

63. (C) Let,

30% of A = 40% B = 12 kg

$\therefore$ A = 40 kg

and, B = 30 kg

$\therefore$ Required percentage

$$= \frac{24}{70}\times 100 = 34.28\%$$

64. (C) A.T.Q,

$$\text{Cost price of article} = \frac{220\times 100}{88} = ₹250$$

$$\therefore \text{Required selling price} = \frac{250\times 112}{100}$$

$= ₹280$

65. (B) Let the number of articles= x

A.T.Q,

$(x - 2) \times 7 = 119$

$\Rightarrow x = 17 + 2 = 19$

$\therefore$ Total number of articles = 19

66. (B) A.T.Q,

Amount after one year

$$= \frac{12000\times 125}{100} = ₹15000$$

After after two year

$$= \frac{15000\times 75}{100} = ₹11250$$

$$\therefore \text{Loss \%} = \frac{12000-11250}{12000}\times 100 = 6.25\%$$

67. (D) Let the cost price of radio = ₹x

$$\text{Selling price of radio} = \frac{125\times x}{100} = \frac{5x}{4}$$

$$\text{Profit} = \frac{x}{4}$$

Now,

Cost price = $₹(x-100)$

and,

$$\text{Selling price} = ₹\left(\frac{5}{4}x - 75\right)$$

$$\text{Profit} = ₹\left(\frac{x}{4} + 25\right)$$

A.T.Q,

$$\frac{x}{4}\times\frac{125}{100} = \frac{x}{4} + 25$$

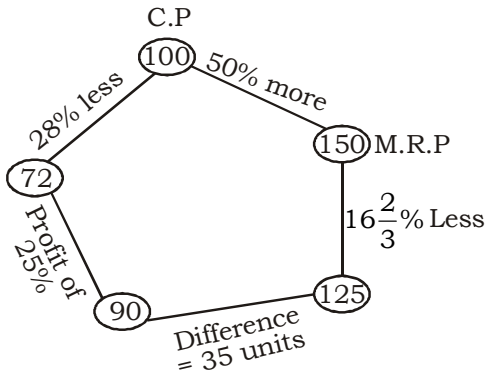
$$\Rightarrow \frac{5x}{16} - \frac{x}{4} = 25$$

$$\Rightarrow \frac{x}{16} = 25$$

$\Rightarrow x = 400$

$\therefore$ Original cost price = ₹400

68. (A) A.T.Q,



$\therefore$ 35 units = ₹105

and,

$$\text{Cost price of the article} = \frac{105}{35}\times 100$$

$= ₹300$

69. (B) A.T.Q,

Selling price of remaining butter

$$= \frac{360\times 85}{100} = ₹306$$

$\therefore$ Selling price of butter

$$= \frac{306}{5} = ₹61.2/\text{kg}$$

70. (C) A.T.Q,
Cost price of first article
$= \frac{6000\times100}{120}$ = ₹5000
$\therefore$ Cost price of second article
= 6000 + 1000 = ₹7000
$\therefore$ loss = $\frac{1000}{7000}\times100$ = 14.28%

71. (C) A.T.Q,
Required cost
$= 6\left[2\times10(20+12)-\left(5\times4+3(3\times2)\right)\right]$
= ₹3612

72. (B) A.T.Q,
Side of square = $\sqrt{1024}$ = 32cm
$\therefore$ Radius of each plate = $\frac{32}{4}$ = 8 cm
$\therefore$ Circumference of each plate
$= 2\times\frac{22}{7}\times8$ = 50.28 cm

73. (D) A.T.Q,
$3\pi r^2 + P = 12\pi r^2$
$\Rightarrow P = 9r^2$
Now,
$3\pi r^2 + 9\pi r^2 = \pi(r+6)^2 \times 3$
$\Rightarrow 12\pi r^2 = 3\pi(r+6)^2$
$\Rightarrow 9r^2 - 36r - 108 = 0$
$\Rightarrow (r-6)(r+2) = 0$
Original radius of cylinder = 6 cm

74. (A) A.T.Q,
Total volume of 6 shperes and 6 cones
$= \left[\pi\times6\times6\times6+\frac{1}{3}\pi\times6\times6\times6\right]$
$= 1728\pi$ cm^3
$\therefore$ Required number of shperes
$= \frac{1728\pi}{\frac{4}{3}\pi\times3\times3\times3}$ = 48

75. (C) Let the height of cylinder be h and cone be H
$\pi r^2 h = \frac{1}{3}\pi r^2 H$
$\Rightarrow H = 3h$
Now,
$\frac{15}{8}(2\pi.r.h) = \pi rl$
$\Rightarrow 15h = 4\sqrt{(3h)^2 + r^2}$
$\Rightarrow 15h = 4\sqrt{9h^2 + r^2}$
$\Rightarrow 225h^2 = 144h^2 + 16r^2$
$\Rightarrow 81h^2 = 16r^2$
$\Rightarrow \frac{r}{h} = 9:4$

76. (B) A.T.Q,
$3x + 4x + 5x + 8x = 360°$
$\Rightarrow x = 18°$
$\therefore$ Second largest angle at the quadrilateral = 90°
$\therefore$ Largest angle of triangle = 90°
Other angles = 30°, 60°
$\therefore$ Second largest angle of the triangle = 60°

77. (A) A.T.Q,
Volume of the iron = $\pi \times 18\,(5^2 - 4^2)$
$= 162\pi$ cm^3
and,
Weight of iron
$= 9 \times 162 \times \frac{22}{7}$ = 4582.28 kg

78. (A) A.T.Q,
Required number of cubes
= (8 – 2) (10 – 2) (14 – 2)
= 576

79. (B) A.T.Q,
Area of incircle
$= \frac{22}{7}\times\frac{84}{2\sqrt{3}}\times\frac{84}{2\sqrt{3}}$ = 1848 cm^3

80. (A) A.T.Q,
Area of isosceles triangle
$= \frac{b}{4}\sqrt{4(a)^2 - b^2}$
Now,
$\frac{5x}{4}\sqrt{64x^2 - 25x^2} = 5\sqrt{39}$
$\Rightarrow x^2.\sqrt{39} = 4\sqrt{39}$
$\Rightarrow x = 2$ cm
$\therefore$ Length of third side = 5 × 2 = 10 cm

81. (A) A.T.Q,
Third year
2400
100
100 + 4
100 + 4 + 4 + .16
2nd year
2500
100
100 + 4
Ist year
2500
100
Amount at the end of three years
= 7500 + 616.16 = ₹8116.16

82. (D) A.T.Q,
$4000 \xrightarrow{40\%} 1600$
$3600 \xrightarrow{40\%} 1440$
$3040 \xrightarrow{40\%} 1216$
Amount of the end of first year
= 4000 + 1600 = ₹5600
Remaining amount after the payment
= 5600 – 2000 = ₹3600
Amount at the end of second year
= 3600 + 1400 = ₹5040
Remaining amount after the payment
= 5040 – 2000 = ₹3040
Amount to be paid at the end of third year to clear all his due
= 3040 + 1216 = ₹4256

83. (B) A.T.Q,
SI for one year = $\frac{9000}{3}$ = ₹3000
Rate = $\frac{3000}{30000}\times 100$ = 10%
Now,
30000
3000
3000 + 300
3000 + 300 + 300 + 30
∴ Required difference = ₹930

84. (C) Let principal amount = 100
A.T.Q,

Principal	Amount
100	120
100	100 + 8r

Now,
$\frac{120}{100+8r} = \frac{4000}{5000} \Rightarrow r = 6.25\%$

85. (A) A.T.Q
Borrowed amount = 80000 – 16000
= ₹64000
Due amount = 148% of 64000
Total installment
= 600% + (5 + 4 + 3 + 2 + 1) × 8 = 720%
∴ 720% = 148% of 64000
100% = 13155.55
∴ Required amount of installment
= ₹13155.55

86. (A) A.T.Q,
Time → 10 : 12
Speed → 6 : 5
$(T-C_1)$ $(T-C_2)$
Difference between speed of two cyclists
= 6 – 4 = 2 km/hr
∴ $(T-C_1) - (T-C_2)$ = 2 km/hr
1 unit = 2 km/hr
6 unit = 12 km/hr
∴ Length of train
$= 12 \times \frac{5}{18}\times 10 = \frac{100}{3}\ m$

87. (A) A.T.Q,
Required time = $\frac{120+160}{7\times\frac{5}{18}}$
= 2 minutes 24 sec

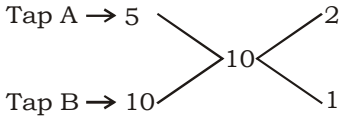
88. (B) A.T.Q,
Time taken to meet each other
$= \frac{120-12}{12+18} = 3.6$ hours
Hence, both trains will meet at
= 10 am + 3 hours 36 minutes
= 01 : 36 pm

89. (D) A.T.Q,

A	B	C
1000	950	
	500	460
500	475	437

∴ Required distance
$= \frac{63}{500}\times 1500$
=189 m

90. (D) A.T.Q,



In 2 hours tank will be fill
= (2 – 1) × 2 = 2 units

∴ Required time = $\frac{10-2}{2}$ = 4 hours

91. (B) Let the speed of Jatin = x km/hr
A.T.Q,

	UP		down
Time	9	:	7
Speed	7	:	9

$\Rightarrow \frac{x+3}{x-3} = \frac{9}{7}$

By componendo and dividendo

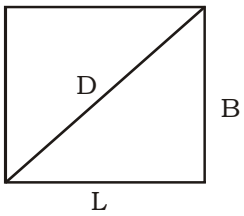
$\frac{x+3+x-3}{x+3-x+3} = \frac{9+7}{9-7}$

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

$\Rightarrow x = 24$

∴ Speed of Jatin in still water = 24 km/hr

92. (B) A.T.Q,



$L + B - D = \frac{L}{4}$

$\Rightarrow \frac{3L+4B}{4} = D$

and,

$L^2 + B^2 = \left(\frac{3L+4B}{4}\right)^2$

$\Rightarrow 16L^2 + 16B^2 = 9L^2 + 16B^2 + 24LB$

$\Rightarrow 7L^2 = 24LB$

$\Rightarrow \frac{L}{B} = \frac{24}{7}$

∴ Required ratio = 24 : 7

93. (A) Let the capacity of vessel = x litre
A.T.Q,

$\frac{16}{25} = \left(1-\frac{6}{c}\right)^2$

$\Rightarrow \frac{4}{5} = \frac{c-6}{c}$

$\Rightarrow c = 30$

∴ Capacity of vessel = 30 litres

94. (C) Let x and y be the LCM and HCF of the two numbers respectively.
A.T.Q,

$x + y = 384$ ..... (i)

and,

$x - y = 336$ ..... (i)

solving equation (i) and (ii), we get

$\Rightarrow x = 360$

$\Rightarrow y = 24$

LCM = 360 = 24 × 15

HCF = 24

∴ Possible prime factor is (5, 3)

∴ Required numbers = 120, 72

95. (A) A.T.Q,

1 + 3 + 6 + 5 + 6 + 9 = 30

∴ Required unit place digit = 0

96. (B) A.T.Q,

Total number of females in Cities B, E and,

$F = \frac{1200\times40}{100} + \frac{600\times60}{100} + \frac{1000\times20}{100}$

= 480 + 360 + 200 = 1040

97. (A) A.T.Q,

Average population of the Cities

$= \frac{900+1200+800+1500+600+1000}{6}$

= 1000

98. (C) A.T.Q,

Required ratio = $\frac{800\times20}{100} : \frac{600\times40}{100}$

= 2 : 3

99. (D) A.T.Q,

Total number of femles in Cities A, C and F

$= \frac{900\times60}{100} + \frac{800\times80}{100} + \frac{100\times20}{100}$

= 540 + 640 + 200 = 1380

100. (B) A.T.Q,

Required ratio

$= \frac{900\times40}{100} : \frac{1500\times50}{100} = 12 : 25$

SSC TIER II (MATHS) MOCK TEST - 39 (ANSWER KEY)

1. (B)	11. (B)	21. (C)	31. (B)	41. (C)	51. (B)	61. (A)	71. (C)	81. (A)	91. (B)
2. (C)	12. (D)	22. (C)	32. (C)	42. (C)	52. (D)	62. (B)	72. (B)	82. (D)	92. (B)
3. (C)	13. (B)	23. (A)	33. (B)	43. (A)	53. (A)	63. (C)	73. (D)	83. (B)	93. (A)
4. (D)	14. (A)	24. (B)	34. (C)	44. (B)	54. (C)	64. (C)	74. (A)	84. (C)	94. (C)
5. (A)	15. (B)	25. (D)	35. (D)	45. (A)	55. (C)	65. (B)	75. (C)	85. (A)	95. (A)
6. (C)	16. (A)	26. (C)	36. (D)	46. (A)	56. (A)	66. (B)	76. (B)	86. (A)	96. (B)
7. (B)	17. (D)	27. (B)	37. (A)	47. (C)	57. (B)	67. (D)	77. (A)	87. (A)	97. (A)
8. (C)	18. (C)	28. (C)	38. (C)	48. (C)	58. (C)	68. (A)	78. (A)	88. (B)	98. (C)
9. (D)	19. (A)	29. (B)	39. (A)	49. (B)	59. (A)	69. (B)	79. (B)	89. (D)	99. (D)
10. (B)	20. (B)	30. (C)	40. (B)	50. (C)	60. (B)	70. (C)	80. (A)	90. (D)	100.(B)

Note:- If your opinion differs regarding any answer, please message the mock test and question number to 8860330003

Note:- Whatsapp with Mock Test No. and Question No. at 7053606571 for any of the doubts, also share your suggestions and experience of Sunday Mock

Note:- If you face any problem regarding result or marks scored, please contact 9313111777