SSC TIER II (MATHS) MOCK TEST - 34 (SOLUTION)

1. **(B)** A.T.Q

   Regular working hours in 8 week

   = 6 × 9 × 8 = 432 hours

   Earning in these working hours

   = (6 × 9 × 8) × 60 = ₹25920

   ∴ Additional amount earned

   = 27670 – 25920 = ₹1750

   Number of hours he work over time

   $= \dfrac{1750}{70} = 25$ hours

   ∴ Required number of hours

   = 432 + 25 = 457 hours

2. **(A)** Let the number of persons in building A = a

   and the number of persons in building B = b

   A.T.Q

   $a – 10 = b + 10$

   $\Rightarrow a – b = 20$ .... (i)

   and

   $3(b – 15) = a + 15$

   $\Rightarrow 3b – 45 = a + 15$

   $\Rightarrow 3b – a = 60$

   Using equation (i), we get

   $3(a – 20) – a = 60$

   $\Rightarrow 3a – 60 – a = 60$

   $\Rightarrow 2a = 120$

   $\Rightarrow a = 60$

3. **(C)** A.T.Q,

   $$= 1 + \cfrac{1}{5 + \cfrac{1}{5 + \cfrac{5}{26}}} = 1 + \cfrac{1}{5 + \cfrac{26}{135}}$$

   $$= \dfrac{701 + 135}{701} = \dfrac{836}{701}$$

4. **(B)** A.T.Q,

   $$\dfrac{1}{\sqrt{16} - \sqrt{15}} = \dfrac{\sqrt{16} + \sqrt{15}}{\left(\sqrt{16} - \sqrt{15}\right)\left(\sqrt{16} + \sqrt{15}\right)}$$

   $$= \dfrac{\sqrt{16} + \sqrt{15}}{16 - 15} = \sqrt{16} + \sqrt{15}$$

   Similarly other terms can be simplified

   $$\therefore \left(\sqrt{16} + \sqrt{15}\right) - \left(\sqrt{15} + \sqrt{14}\right) + \left(\sqrt{14} + \sqrt{13}\right)$$

   $$- \left(\sqrt{13} + \sqrt{12}\right) + \left(\sqrt{12} + \sqrt{10}\right) - \left(\sqrt{10} + \sqrt{9}\right)$$

   $$= \sqrt{16} - \sqrt{9} = 4 - 3 = 1$$

5. **(D)** Let the number is x.

   A.T.Q,

   ```
   6 | x
   7 | y + 4
   8 | z + 5
     | 1 + 6
   ```

   $x = 6y + 4$

   $y = 7z + 5$

   $z = 8 × 1 + 6 = 14$

   $y = 14 × 7 + 5 = 103$

   and $x = 103 × 6 + 4 = 622$

   when 622 is reparately divided by 6, 7 and 8 then the remainder.

   ```
        103        88         77
   6 | 622     7 | 622    8 | 622
       618        616        616
         4          6          6
   ```

   ∴ Required remainders = 4, 6 and 6.

6. **(A)** Let the first part = x

   and, second part = $525 – x$

   We know that

   Product of two numbers = product of LCM and HCF.

   $x(525 – x) = 2750 × 25$

   $\Rightarrow 525x – x^2 = 68750$

   $\Rightarrow x^2 – 525x + 68750 = 0$

   $\Rightarrow x^2 – 275x – 250x + 68750 = 0$

   $\Rightarrow x(x – 275) – 250(x – 275) = 0$

   $\Rightarrow x = 275$ and $x = 250$

   ∴ Required difference = 25

7. **(D)** A.T.Q

   Price of type A tea after x years from 1997 = (4.20) + (x × 0.40)

   price of type B tea after x years from 1997 = 6.30 + (x × 0.15)

   Now,

   4.20 + (x × .40) = 6.30 + (x × 0.15) + 0.40

   $\Rightarrow 4.20 + 0.40x = 6.30 + 0.15x + 0.40$

   $\Rightarrow 0.25x = 2.5$

   $\Rightarrow x = 10$

   ∴ Required year = 1997 + 10 = 2007

8. **(B)** A.T.Q

   $$\left(\sqrt{3} + 1\right)\left(10 + \sqrt{12}\right)\left(\sqrt{12} - 2\right)\left(5 - \sqrt{3}\right)$$

   $$= \left[2\left(\sqrt{3} + 1\right)\left(\sqrt{3} - 1\right)\right]\left(10 + \sqrt{12}\right)\left(5 - \sqrt{3}\right)$$

   $$= 8\left[\left(5 + \sqrt{3}\right)\left(5 - \sqrt{3}\right)\right]$$

   $$= 8[25 – 3] = 176$$

9. (A) A.T.Q

$$\frac{\left(x-\sqrt{48}\right)\left(10+\sqrt{75}\right)}{10-\sqrt{75}}=1$$

$$\Rightarrow \frac{\left(x-4\sqrt{3}\right)\left(5\times2+5\sqrt{3}\right)}{\left(5\times2-5\sqrt{3}\right)}=1$$

$$\Rightarrow \frac{\left(x-4\sqrt{3}\right)\left(2+\sqrt{3}\right)}{\left(2-\sqrt{3}\right)}=1$$

$$\Rightarrow \left(x-4\sqrt{3}\right)\left(2+\sqrt{3}\right)^2=1$$

$$\Rightarrow \left(x-4\sqrt{3}\right)\left(4+3+2\times2\sqrt{3}\right)=1$$

$$\Rightarrow x-4\sqrt{3}=7-4\sqrt{3}=x=7$$

∴ Required value of x = 7

10. (C) Let the number = $10x + y$

A.T.Q,

$xy = 63$

and,

$10x + y - 18 = 10y - x$

$\Rightarrow 9x - 9y = 18$

$\Rightarrow x - y = 2$

∴ Required number = 97

11. (A) A.T.Q,

A + B – 9 ⟍ 28
B + C – $\frac{21}{2}$ 24 ⟩ 252
C + A – 12 ⟋ 21

∴ Required number of days

$$= \frac{252}{73} = 3\frac{33}{73} \text{ days}$$

12. (D) A.T.Q,

$12\,W \times 14 = 12C \times 21$

$$\Rightarrow \frac{W}{C} = \frac{3}{2}$$

∴ Required number of days

$$= \frac{14\times3\times12}{\left(6\times3+12\times2\right)} = \frac{504}{42} = 12 \text{ days}$$

13. (C) A.T.Q,

3M + 4B = 101 .... (i)

12M + 14B = 376 .... (ii)

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

B = 14

and, M = 15

∴ Required number of days

$$= \frac{3144}{8\times14+10\times15} = \frac{3144}{262} = 12 \text{ days}$$

14. (A) A.T.Q,

45 men can do rest of work in 8 days

∴ 24 men can do the work = $\frac{45\times8}{24}$ = 15

∴ Required number of days

= 40 + 15 – 50 = 5 days

15. (B) A.T.Q,

$$\frac{p^2}{100}+\frac{q^2}{100}=\frac{2pq}{100}$$

$\Rightarrow (p - q)^2 = 0$

$\Rightarrow p = q$

∴ Required percentage = 100%

16. (B) A.T.Q,

Capacity $\alpha\, D^2$

Ratio of their diameters = $\frac{1}{2} : \frac{3}{2} : 2$

= 1 : 3 : 4

∴ Total capicity of cistern = 39 × 16 = 624

∴ Required time = $\frac{624}{1+9+16}$ = 24 minutes

17. (B)

	Team A	Team B
No. of question	400	360
Time	x	$x + 2$

A.T.Q,

$$\frac{400}{x}-\frac{360}{x+2}=5$$

$\Rightarrow x^2 - 6x - 160 = 0$

$\Rightarrow x^2 - 16x + 10x - 160 = 0$

$\Rightarrow x(x - 16) + 10 (x - 16) = 0$

$\Rightarrow x = 16, -10$

∴ Required number of questions

$$= \frac{360}{16+2} = 20$$

18. (D) A.T.Q

Required amount of mater in container

A = 60 $-\frac{2}{3}\times30-\frac{40}{2}$ = 20 litre

19. (D) A.T.Q,

Present age of Sachin = 9 + 5 = 14 years

Rohit uncle's age after 12 years

= (14 + 12)2 + 16 = 68 years

∴ Rohit's present age = $\frac{3\left(68-12\right)}{4}$

= 42years

20. (D) A.T.Q

Weight of new person = (11 × 3.2) + 62.8

= 35.2 + 62.8 = 98 kg

21. (C) Let the average age of the cricket team = x
A.T.Q,
$11x - 25 - 28 = (x - 1)9$
$\Rightarrow 11x - 53 = 9x - 9$
$\Rightarrow 2x = 44$
$\Rightarrow x = 22$

22. (A) A.T.Q,
Total quantity of rice shopkeeper buys
$$= \left(\frac{3600}{7.2} + \frac{3600}{7.5} + \frac{3600}{8} + \frac{3600}{9} \right)$$
$= (500 + 480 + 450 + 400) = 1830$ kg
$\therefore$ Required cost price $= \dfrac{3600 \times 4}{1830} = ₹7.8$

23. (A) A.T.Q
Cost price of the mixture $= \dfrac{75 \times 100}{137.5} = \dfrac{600}{11}$
$\therefore$ Pure milk $= \dfrac{600}{11 \times 60} = \dfrac{10}{11}$
$\therefore$ Required ratio = 1 : 10

24. (C) Let man purchased number of oranges be a and number of apples be b and let cost of a orange is x and a apple is y.
A.T.Q,
$$a + b = 27$$
$$ax + by = 18$$
and
$$\dfrac{bx + ay = 15}{(a+b)(x+y) = 33}$$
$\Rightarrow x + y = \dfrac{33}{27} = \dfrac{11}{9} = ₹1.22$

25. (B) Let the cost price of 1 litre milk = ₹1
A.T.Q,
SP of 16 litre mixture = 16 × 2 = ₹32
Required profit % $= \dfrac{32 - 12}{12} \times 100$
= 166.66%

26. (A) Let cost price of a article = x
A.T.Q,
Total cost price = 200x + 50
Total selling price
$$= (120 \times 13.50) + \left(\frac{80 \times 13.50 \times 75}{100} \right)$$
= 1620 + 810 = 2430
Now,
$$2430 - 200x - 50 = \left(\frac{200x + 50}{100} \right) \times 40$$
$\Rightarrow x = ₹8.4$

27. (D) A.T.Q,
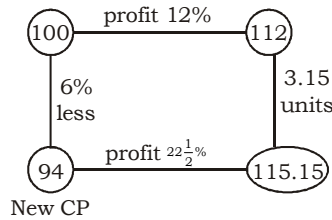
$\therefore$ Initial cost price $= \dfrac{63}{3.15} \times 100 = ₹2000$

28. (A) A.T.Q.,
$25\% = \dfrac{25}{100} = \dfrac{1}{4}$

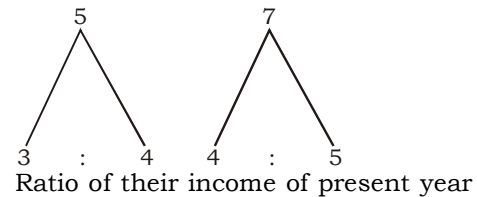|	Initial	Now
Price	4	5
Consumption	15	x
Expenditure	60	5x

$\therefore$ Now expenditure $= \dfrac{60 \times 110}{100} = 66$
$\therefore x \times 5 = 66$
$\Rightarrow x = \dfrac{66}{5}$
$\therefore$ New consumption = 13.2 kg

29. (D) A.T.Q

Ratio of their income of present year
$= 5 \times \dfrac{4}{3} : 7 \times \dfrac{5}{4} = 16 : 21$
$\therefore$ Present income of Sandeep
$\dfrac{4625}{37} \times 16 = ₹2000$

30. (C) A.T.Q,
Ratio of their investment
= 17500 : 13500 = 35 : 27
$\therefore \left(\dfrac{30 \times 35}{62} - \dfrac{30 \times 27}{62} \right)$ units = 480
$\Rightarrow 2.4$ units = 480
$\therefore$ Total profit $= \dfrac{480}{2.4} \times 62 = ₹12400$

31. (D) A.T.Q,
$15\% \Rightarrow 20 - 17$
$20\% \Rightarrow 5 - 4$
$25\% \Rightarrow 4 - 3$
$\overline{400 - 204}$
$\therefore$ Required discount $= \dfrac{196}{400} \times 100 = 49\%$

32. (B) Let the initial cost price of apple = x

A.T.Q.,

$$\frac{120}{x} - \frac{120 \times 4}{5x} = 4 \Rightarrow \frac{120}{5x} = 4$$

$\Rightarrow x = 6$

$\therefore$ Increased price of apple

$$= \frac{6 \times 125}{100} = ₹7.5$$

33. (D) Let cost price of each article = 100

A.T.Q

	CP	SP
Ist article –	100	137.5
2nd article –	100	x
Both article –	200	250

SP of 2nd article = 250 – 137.5 = 112.5

Cost price of each article

$$= \frac{2500}{25} \times 100 = ₹10000$$

34. (A) A.T.Q.

Book	Pen
12% p	19% $p - x$ .... (i)
19% p	12% $p - x + 140$ .... (ii)

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

–7% (B – P) = – 140

B – P = 2000

and, $\underline{B + P = 21000}$

2B = 23000

$\Rightarrow$ B = 11500

and P = 9500

$\therefore$ Cost price of Book and Pen are ₹11500 and ₹9500 respectively.

35. (D) A.T.Q,

$$\begin{bmatrix} 1 - 3 & \times 40 \\ 1 - 5 & \times 24 \\ 3 - 8 & \times 15 \end{bmatrix} 120$$

Now

40 – 120

24 – 120

45 – 120

Cost price of 240 articles = ₹64

Selling price of 240 articles = ₹90

If loss is 26, then number of articles is 240.

Hence, Total number of articles

$$= \frac{240}{26} \times 78 = 720$$

36. (B)

CP	MRP	SP
100	150	120
	↓×2	↓
	300	200

Required percentage

$$= \frac{200 - 120}{120} \times 100 = 66\frac{2}{3}\%$$

37. (B) A.T.Q,

26CP – 26SP = 8CP

$\Rightarrow$ 18CP = 26SP

$$\Rightarrow \frac{CP}{SP} = \frac{26}{18}$$

$\therefore$ Profit % $= \frac{8}{26} \times 100 = 30\frac{10}{13}\%$

38. (D) A.T.Q,

2006 – 2007 $= \frac{50 - 35}{50} \times 100$

= 30% decrease

2007 – 2008 $= \frac{35 - 25}{35} \times 100$

= 28.57 decrease

2008 – 2009 $= \frac{40 - 25}{25} \times 100$

= 60% increase

$\therefore$ Required year = 2009

39. (D) A.T.Q,

Required ratio $= \left(\frac{40 + 45 + 30 + 55}{4}\right) :$

$\left(\frac{50 + 35 + 25 + 40}{4}\right) = 17 : 15$

40. (B) A.T.Q,

Average production of company A

$$= \frac{40 + 45 + 30 + 55}{4} = 42.5 \text{ lakhs}$$

Average production of company B

$$= \frac{50 + 35 + 25 + 40}{4} = 37.5 \text{ lakhs}$$

Average production of company C

$$= \frac{30 + 40 + 35 + 30}{4} = 33.75 \text{ lakhs}$$

41. (B) For year 2007, company C has maximum production (40 lakhs)

42. (C) A.T.Q,

Required percentage $= \frac{55 - 30}{30} \times 100$

$= 83\frac{1}{3}\%$

43. (C) A.T.Q

$$\tan\theta = \sqrt{12 - \sqrt{12 - \sqrt{12 - \text{........}\infty}}}$$

Here, 12 = 4 × 3

$\therefore \tan\theta = 3$

$\therefore \csc^2\theta = \left(\frac{\sqrt{10}}{3}\right)^2 = \frac{10}{9}$

44. (A) A.T.Q

$\tan\theta + \cot\theta = p$ and $\sec\theta - \cos\theta = q$

$\Rightarrow \dfrac{1+\cot^2\theta}{\cot\theta} = p$ and $\dfrac{1-\cos^2\theta}{\cos\theta} = q$

$\Rightarrow \dfrac{\csc^2\theta}{\cot\theta} = p$ and $\dfrac{\sin^2\theta}{\cos\theta} = q$

$\Rightarrow \dfrac{1}{\sin\theta\cos\theta} = p$ and $\dfrac{\sin^2\theta}{\cos\theta} = q$

$\therefore (p^2 q)^{2/3} - (pq^2)^{2/3}$

$= \left(\dfrac{1}{\sin\theta^2\cos^2\theta} \times \dfrac{\sin^2\theta}{\cos\theta}\right)^{2/3} - \left(\dfrac{1}{\cos\theta\sin\theta} \times \dfrac{\sin^4\theta}{\cos^2\theta}\right)^{2/3}$

$= \dfrac{1}{\cos^2\theta} - \dfrac{\sin^2\theta}{\cos^2\theta}$

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

Hence, $(p^2\ q)^{2/3} - (pq^2)^{2/3} = 1$

45. (A) A.T.Q.,

$\dfrac{\sin 35°}{\cos 55°} + \dfrac{\tan 78°}{\cot 12°} + \dfrac{\sin 135°}{\cos 45°} + \dfrac{\cos 150°}{\sec 30°} - 1$

$= 1 + 1 + 1 - \left(\dfrac{\sqrt{3}}{2}\right)^2 - 1 = \dfrac{5}{4}$

46. (A) A.T.Q,

$\sin\theta = \dfrac{20}{29}$
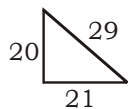
$\therefore \dfrac{3\tan\theta + 2\cot\theta}{3\tan\theta - 2\cot\theta} = \dfrac{3\times\dfrac{20}{21} + 2\times\dfrac{21}{20}}{3\times\dfrac{20}{21} - 2\times\dfrac{21}{20}}$

$= \dfrac{347}{53}$

47. (A) A.T.Q,

$\cot 18°\left(\cot 72°.\cos^2 22° + \dfrac{1}{\tan 72°.\sec^2.68°}\right)$

$= \cot 18°.\cot 72°\ (\cos^2 22° + \cos^2 68°)$

$= 1 \times (\sin^2 68° + \cos^2 68°) = 1$

48. (A) A.T.Q,

$\sin^2\theta + \cos^2\theta + \sec^2\theta + \csc^2 + \tan^2\theta + \cot^2\theta$

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

$= 3 + 2\tan^2\theta + 2\cot^2\theta$

$\therefore$ Minimum value $= 3 + 2\times 2\sqrt{1\times 1}$

$= 3 + 4 = 7$

49. (B) A.T.Q.,
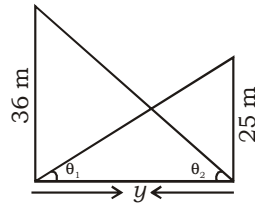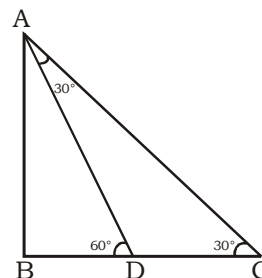

If $\theta_1 + \theta_2 = 90°$, then $y = \sqrt{h_1 \times h_2}$

$\therefore y = \sqrt{36\times 25} = 30$ m

50. (A) A.T.Q.,

In $\triangle ADC$,

$\angle DCA = \angle DAC = 30°$

$\therefore AD = DC = 54$ cm

(opp. sides of equal angles)

In $\triangle ABD$,

$\therefore \tan 60° = \sqrt{3}$

$\dfrac{AB}{\sqrt{3}} \quad \dfrac{BD}{1} \quad \dfrac{AD}{2}$

$\therefore BD = \dfrac{54}{2} = 27$ cm

51. (B) A.T.Q.

$x + \dfrac{1}{x+8} = 0$

Putting value $a = x + 8$

$\therefore a - 8 + \dfrac{1}{a} = 0 \Rightarrow a + \dfrac{1}{a} = 8$

Now,

$\left(a + \dfrac{1}{a}\right)^2 = (8)^2 \Rightarrow a^2 + \dfrac{1}{a^2} = 62$

$\Rightarrow \left(a - \dfrac{1}{a}\right)^2 + 2 = 62 \Rightarrow a - \dfrac{1}{a}$

$= \sqrt{60} = 2\sqrt{15}$

and,

$a = x + 8$

$\therefore x + 8 - \dfrac{1}{x+8} = 2\sqrt{15}$

$\Rightarrow x - \dfrac{1}{x+8} = 2\sqrt{15} - 8$

52. (A) A.T.Q,

$x^2 + 4x = 4$

We have to find the value of

$(x + 5)^2 + \dfrac{1}{(x+5)^2}$

$= \left(x + 5 + \dfrac{1}{x+5} \right)^2 - 2$

$= \left(\dfrac{x^2 + 25 + 10x + 1}{x+5} \right)^2 - 2$

$= \left(\dfrac{x^2 + 4x + 6x + 26}{x+5} \right)^2 - 2$

$= \left(\dfrac{6x + 30}{x+5} \right)^2 - 2$

$= 36 - 2 = 34$

53. (C) A.T.Q.,

$5x + 7 = 3x + 19$

$\Rightarrow 2x = 12$

$\Rightarrow x = 6$

$\therefore (x + 3)^3 = (6 + 3)^3 = 729$

54. (D) A.T.Q.,

$a + b = p$ .... (i)

$ab = q^2$ .... (ii)

$a^3 + b^3 - a^2b - b^2a$

$= (a + b)^3 - 3ab\,(a + b) - a^2b - b^2a$

$= (a + b)^3 - 4a^2b - 4ab^2$

$= (a + b)^3 - 4ab(a + b)$

$= (p)^{3} - 4q^2(p)$

$= p^3 - 4pq^2$

$\therefore a^3 + b^3 - a^2b - b^2a = (p^2 - 4q^2)p$

55. (C) A.T.Q

$x + y + z = 2$ .... (i)

and

$x^2 + y^2 + z^2 = 50$ .... (ii)

putting the value of $x = 3$, $y = 4$ and $z = -5$

$\therefore xy + z\,(x + y) = 12 + (-5)(7) = 12 - 35$

$= -23$

56. (A) A.T.Q.,

Time taken by person A to travel from Q

to P $= \dfrac{50}{12.5} = 4$ hours

Time taken by person B to travel from Q

to P $= \dfrac{50}{10} = 5$ hours

$\therefore$ Required answer $= \dfrac{60}{30} = 2$ times

57. (B) A.T.Q,

$= x = \dfrac{\sqrt{3} + 1}{2}$

$\Rightarrow 2x - 1 = \sqrt{3}$

$\Rightarrow 4x^2 + 1 - 4x = 3$

$\Rightarrow 4x^2 - 4x - 2 = 0$

$\Rightarrow 2x^2 - 2x - 1 = 0$

and

$4x^3 + 2x^2 - 8x + 7$

$= (2x^2 - 2x - 1)\,(2x + 3) + 10$

$\therefore 4x^3 + 2x^3 - 8x + 7 = 10$

58. (D) A.T.Q,

$\dfrac{1}{1000^2 - 1000} + \dfrac{1}{1001^2 - 1001} + \cdots\cdots + $

$\dfrac{1}{999999^2 - 999999}$

$= \dfrac{1}{999} - \dfrac{1}{1000} + \dfrac{1}{1000} - \dfrac{1}{1001} \cdots\cdots + $

$\dfrac{1}{999998} - \dfrac{1}{999999}$

$= \dfrac{1}{999} - \dfrac{1}{999999}$

$= \dfrac{1001 - 1}{999999} = \dfrac{1000}{999999}$

59. (B) A.T.Q,

$\dfrac{b}{a} - \dfrac{a}{b} = 2$

Let $\dfrac{b}{a} = x$

$\Rightarrow x^2 + \dfrac{1}{x^2} = 6$

$\Rightarrow \left(x + \dfrac{1}{x} \right)^2 - 2 = 6$

$\Rightarrow x + \dfrac{1}{x} = 2\sqrt{2}$

and, $x^2 + \dfrac{1}{x^2} - 1 = 5$

Now

$x^3 + \dfrac{1}{x^3} = \left(x + \dfrac{1}{x} \right)\left(x^2 + \dfrac{1}{x^2} - 1 \right)$

$\Rightarrow x^3 + \dfrac{1}{x^3} = 2\sqrt{2} \times 5 = 10\sqrt{2}$

$\therefore \dfrac{b^3}{a^3} + \dfrac{a^3}{b^3} = 10\sqrt{2}$

60. (B) A.T.Q,

$$\left(1+\frac{1}{x}\right)\left(1+\frac{1}{x+1}\right)\left(1+\frac{1}{x+2}\right)..\left(1+\frac{1}{x+33}\right)$$

$$=\left(\frac{x+1}{x}\right)\left(\frac{x+2}{x+1}\right)\left(\frac{x+3}{x+2}\right)......\left(\frac{x+34}{x+33}\right)$$
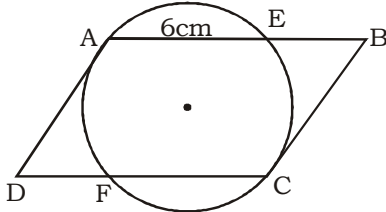
$$=\frac{x+34}{x}$$

61. (C) In PQR
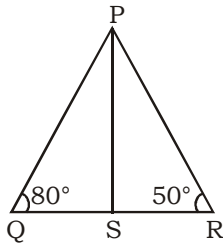
∠QPR = 180° – 80° – 50° = 50°

∴ AD is the angle bisector

∴ ∠QPS = $\frac{1}{2}$ × 50° = 25°

62. (D)

BE × AB = BC²

⇒ 2 × 8 = BC²

⇒ BC = 4 cm

and

AD² = DF × DC

⇒ 16 = x × (15 + x)

⇒ 0 = x² + 15x – 16

⇒ (x + 16) (x – 1) = 0

⇒ x = 1

∴ Length of DF = 1 cm

63. (C)
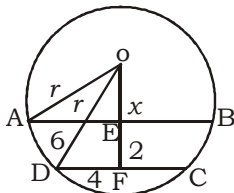
In △AOE,

r² = 36 + x² .... (i)

and,

In △DOF,

r² = 16 + (x + 2)² .... (ii)

Solving equation (i) and (ii)

x = 4

∴ r² = 36 + 16

⇒ r = $\sqrt{52}$ = $2\sqrt{13}$ cm

∴ Length of radius = $2\sqrt{13}$ cm

64. (A) A.T.Q,
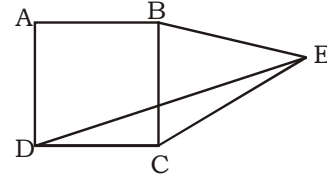
∠DCE = 90° + 60° = 150°

∵ DC = CE

∴ ∠DEC = EDC

∴ ∠DEC = $\frac{180°-150°}{2}$ = 15°

65. (B) A.T.Q,
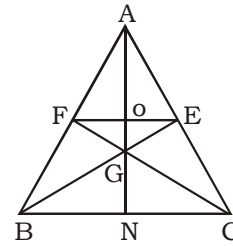
In △BGC and △EGF

$$\frac{BG}{GE}=\frac{GN}{GO}$$

$$\Rightarrow \frac{6}{3}=\frac{4}{GO}\Rightarrow GO = 2\ cm$$

∴ Required ratio = (8 – 2) : 2 = 6 : 2 = 3 : 1

66. (A) A.T.Q,
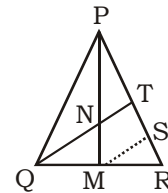
Area of △PMR = $\frac{1}{2}$ area (△PQR)

MS ∥ QT

and △QRT ∼ △MRS

∴ M is the midpoint of QR

∵ TS = SR .... (i)

In △PMS and △PNT

∵ N is the mid-point of PM

⇒ PT = TS .... (ii)

and, $\frac{ar\triangle PNT}{ar\triangle PMS}=\frac{PT^2}{PS^2}=\left(\frac{1}{2}\right)^2=\frac{1}{4}$ .....(iii)
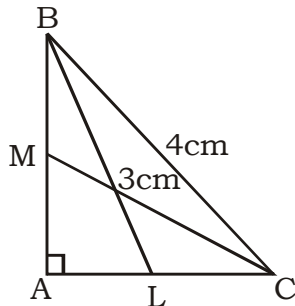
From equation (i) and (ii)

PT = TS = SR

$\Rightarrow$ MS bisect PR is 2 : 1

$\Rightarrow$ Area of PMS = $\dfrac{12}{3} \times 2$ = 8cm^2

From equation (iii)
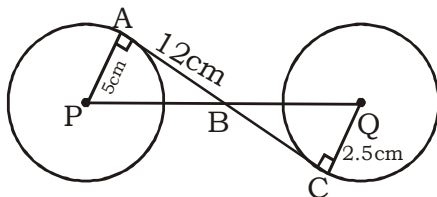
Area of PNT = $\dfrac{8}{4}$ = 2 cm^2

67. (D) A.T.Q,

$4(BL^2 + CM^2) = 5BC^2$

$\Rightarrow 4(3)^2 + 4CM^2 = 5(4)^2$

$\Rightarrow 4CM^2 = 80 - 36$

$\Rightarrow CM = \sqrt{11}$ cm

68. (D) A.T.Q,

In $\triangle$ PAB,

PB = $\sqrt{5^2 + 12^2}$ = 13 cm

$\triangle$ PAB $\sim \triangle$ BCQ

$\dfrac{BC}{QC} = \dfrac{AB}{AP}$

$\Rightarrow$ BC = $\dfrac{12 \times 2.5}{5}$ = 6 cm

Now, In $\triangle$ BCQ,

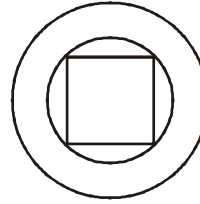BQ = $\sqrt{(2.5)^2 + 6^2}$ = $\sqrt{42.25}$ = 6.5 cm

$\therefore$ Length of PQ = 13 + 6.5 = 19.5 cm

69. (B) A.T.Q,

Diagonal of the square = $\sqrt{2} \cdot \sqrt{\text{area}}$

= $\sqrt{2 \times 33800}$ = 260 m

$\therefore$ Required time = $\dfrac{260 \times 60}{5.2 \times 1000}$ = 3 min.

70. (B) Side of square = $\dfrac{120}{4}$ = 30 m

$\therefore$ Radius of inner circle = $\dfrac{30}{\sqrt{2}}$ m

and,

radius of outer circle = $\dfrac{30}{\sqrt{2}} + 4\sqrt{2} = \dfrac{38}{\sqrt{2}}$ m

$\therefore$ Area of circular field

= $\dfrac{22}{7} \left[\left(\dfrac{38}{\sqrt{2}}\right)^2 - \left(\dfrac{30}{\sqrt{2}}\right)^2 \right]$ = $\dfrac{5984}{7}$ m^2

$\therefore$ Required cost = $\dfrac{5984}{2 \times 7} \times 70$ = ₹29920

71. (D) Let the radius of first cone and second cone are r_1 and r_2 respectively and radius of cylinder is R

A.T.Q,

$\pi R^2 h : \dfrac{1}{3} \pi r_1^2 h : \dfrac{1}{3} \pi r_2^2 h = 7 : 3 : 4$

$\Rightarrow R^2 : r_1^2 : r_2^2 = 7 : 9 : 12$

$\Rightarrow R^2 = 7k, r_1^2 = 9k$ and $r_2^2 = 12$ k

Now,

Ratio of the area of base of cylinder to area of base of two cones
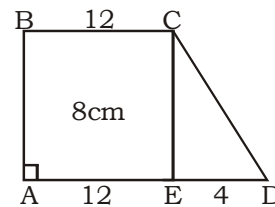
= $2\pi R^2 : (\pi r_1^2 + \pi r_2^2)$

= $2R^2 : (r_1^2 + r_1^2)$

$\therefore 2R^2 : (r_1^2 + r_2^2) = 2(7k) : (9k + 12k)$

$\Rightarrow 14k : 21$ k

$\therefore$ Required percentage = $\dfrac{7}{14} \times 100$ = 50%

72. (D) A.T.Q,

$112 = \dfrac{1}{2}$ (12 + 16) × height

$\Rightarrow$ Height = 8 cm

ED = AD − AE = 16 − 12 = 4 cm

In $\triangle$ CED,

CD^2 = $\sqrt{8^2 + 4^2}$ = $\sqrt{80}$ = $4\sqrt{5}$ cm

73. (C) A.T.Q

Required area $\left[(80)^2 - 4\left(\dfrac{\pi}{4}(40)^2\right) \right]$

= 1371.42 cm²

74. (B) A.T.Q,
Required length of rod

= $\sqrt{32^2 + 24^2 + 20^2}$ = $\sqrt{2000}$ = $20\sqrt{5}$ cm

75. (C) A.T.Q,

Volume of sphere = $\dfrac{4}{3}\pi\left(\dfrac{P}{2}\right)^3 = \dfrac{\pi}{6}p^3$

Side of cube = $\dfrac{p}{\sqrt{3}}$

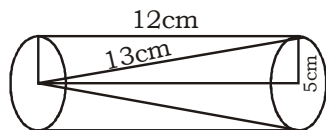Volume of cube = $\dfrac{p^3}{3\sqrt{3}}$

∴ Remaining volume

= $\dfrac{\pi p^3}{6} - \dfrac{p^3}{3\sqrt{3}}$

= $\dfrac{p^3}{3}\left(\dfrac{\pi}{2} - \dfrac{1}{\sqrt{3}}\right)$ unit

76. (C) A.T.Q,
$\pi(10 + x)^2 \times 4 = \pi(10)^2 \times (4 + x)$
$\Rightarrow 100 + x^2 + 20x = 100 + 25x$
$\Rightarrow x^2 - 5x = 0$
$\Rightarrow x(x - 5) = 0$
$\Rightarrow x = 5$ cm
∴ Required increment = 5 cm

77. (D) A.T.Q,

Whole surface area of the remaining solid

= $\pi r l + 2\pi rh + \pi r^2$

$l = \sqrt{5^2 + 12^2}$ = 13 cm

∴ = $\pi r[l + 2h + r]$

= $\dfrac{22}{7} \times 5[13 + 2 \times 12 + 5]$

= 660 cm²

78. (C) A.T.Q,

$\dfrac{343\sqrt{3}}{5} = \dfrac{\sqrt{3}}{4}(7)^2 \times$ height

$\Rightarrow$ Height = $\dfrac{343\sqrt{3} \times 4}{5 \times \sqrt{3} \times 49}$ = 5.6 cm

79. (A) A.T.Q,
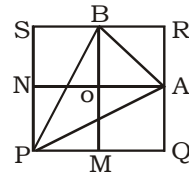
Area of ▢AOBR = $\dfrac{1}{4} \times 48$ = 16 cm²

∴ Area of △ABR = $\dfrac{1}{2} \times 16$ = 8 cm²

Area of ▢PMBS = $\dfrac{1}{2} \times 48$ = 24cm²

Area of △PBS = $\dfrac{1}{2} \times 24$ = 12cm²

and, Area of △PAQ = $\dfrac{1}{2} \times 24$ = 12cm²

ar(ABR) + ar(PBS) + ar(PAQ)
= 8 + 12 + 12 = 32 cm²
Hence, ar(PAB) = 48 – 32 = 16 cm²
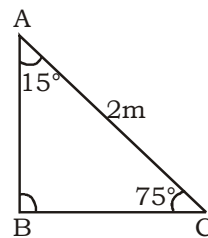
80. (C) A.T.Q,
Area of corridor = 150 × 4 = 600 m²

Length of carpet = $\dfrac{600 \times 100}{75}$ = 800 cm

∴ Required expenditure = 21 × 800
= ₹16800

81. (C) A.T.Q,

$\dfrac{AB}{BC} = \sin 75°$

$\Rightarrow AB = 2\sin 75°$ .... (i)

and, $\dfrac{BC}{AC} = \sin 15°$

$\Rightarrow BC = 2\sin 15°$ .... (ii)

Area of triangle = $\dfrac{1}{2} \times AB \times BC$

= $\dfrac{1}{2} \times 2\sin 75°. 2\sin 15°$

= $\dfrac{1}{2} \times 2\sin 15°. 2\cos 15° = \sin 30°$

= $\dfrac{1}{2}$ m² = 5000 cm²

82. (A) A.T.Q

Time taken to meet first time = $\dfrac{600}{15 + 60}$

= 8sec

Time taken to meet second time

= $\dfrac{600}{30 + 30}$ = 10sec

Time taken to meet third time

= $\dfrac{600}{60 + 15}$ = 8 sec

∴ Total time = (8 + 10 + 8) = 26 seconds

83. (B) A.T.Q,

28 ←Distance

Speed₁ →7   8 ←Speed₂

Time₁ →4   7/2 ←Time₂

Time taken = 4 hours and 3.5 hours

Ratio of their speed = 7 : 8
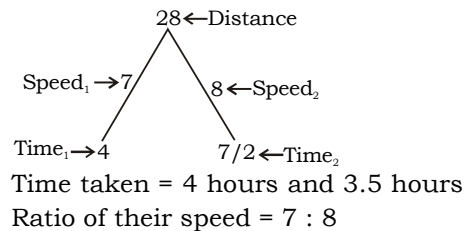
∴ Required time = 8.30 + $\dfrac{28 - 3.5}{15}$

= 8.30 + 98 minutes = 10:08 pm

84. (B) A.T.Q,

Principal   Amount   Interest

72 ⟨ 9× 8   11 × 9 ⟶   3
     8× 9   13 × 8 ⟶   4

72   99 ⟶ 27 ⟩ 5 units
72   104 ⟶ 32

∴ Required rate = $\dfrac{5 \times 100}{3 \times 72}$ = 2.31%

85. (B) A.T.Q,

Principal   Amount
P   3P

∴ Required rate = $\dfrac{2P \times 100}{P \times 16}$ = 12.5%

86. (D) A.T.Q,

480 = $\dfrac{P \times R \times 3}{100}$

PR = 16000 .... (i)

and,

376.20 = $P\left[\left(1 + \dfrac{R}{100}\right)^2 - 1\right]$

⇒ 376.20 = $P\left[\left(\dfrac{R^2}{(100)^2}\right) + \dfrac{2R}{100}\right]$

⇒ 376.20 = $\left[PR \times \dfrac{R}{(100)^2} + \dfrac{2PR}{100}\right]$

⇒ 376.20 = 1.6 × R + 320

⇒ 376.20 – 320 = 1.6R

⇒ R = $\dfrac{56.2}{1.6}$

⇒ R = $35\dfrac{1}{8}$ %

87. (C) A.T.Q,

Required amount

= $\dfrac{37.44 \times 100 \times 100 \times 100}{12 \times 12 \times (300 + 12)}$ = 833.3

88. (A) A.T.Q

Let installment of each year be ₹x.

Then,

18200

= $\dfrac{x}{\left(1 + \dfrac{r}{100}\right)} + \dfrac{x}{\left(1 + \dfrac{r}{100}\right)^2} + \dfrac{x}{\left(1 + \dfrac{r}{100}\right)^3}$

⇒ 18200 = $x\left[\dfrac{5}{6} \times \left(\dfrac{5}{6}\right)^2 + \left(\dfrac{5}{6}\right)^3\right]$

⇒ 18200 = $\dfrac{5x}{6}\left[1 + \dfrac{5}{6} + \dfrac{25}{36}\right]$

⇒ 18200 = $\dfrac{5x}{6} \times \dfrac{91}{36}$

On solving we get,

x = 8640

89. (B) A.T.Q,

```
        T      C
       80    260    6 hours
+40 (
      120    220    6hour/10minutes        ) +10 min.
+220(                                       ) +10 ×5.5
      340    0 km   7 hour/05minutes        ) = 55 min.
```

∴ Speed of train = $\dfrac{340}{85} \times 12$ = 48 km/hr.

90. (B) Let the time taken by Rahul to run 1000 meters = x seconds.

Time taken by Rohan to run 900 meters = $x + 20$ seconds

$\dfrac{\dfrac{1000}{900}}{x + 20} - \dfrac{\dfrac{950}{1000}}{x} = 25$

⇒ $\dfrac{10x + 200}{9} - \dfrac{19x}{20} = 25$

⇒ 29x = 500

⇒ $x = \dfrac{500}{29}$ seconds

91. (B) A.T.Q,

Let speed of second train = x m/s

Speed of first train = $\dfrac{225}{45}$ = 5m/s

$\therefore \dfrac{450}{x+5} = 20$

$\Rightarrow x = 17.5$ m/s

$\therefore$ Required speed = $\dfrac{17.5 \times 18}{5}$ = 63 km/hr

92. (C) A.T.Q,

$x \cos 45° = y \sec 30°$

$\dfrac{x}{y} = \dfrac{2\sqrt{2}}{\sqrt{3}}$

$\dfrac{x^4}{y^4} = \dfrac{16 \times 4}{3 \times 3} = \dfrac{2^6}{3^2}$

93. (D) Let speed of swimmer = x km/hr
Speed of current = y km/hr.
A.T.Q.,

$\dfrac{7}{60}(x+y) - \dfrac{7}{60}(x-y) = \dfrac{140}{1000}$ km

$\Rightarrow \dfrac{7}{60}[x + y - x + y] = \dfrac{140}{1000}$ km

$\Rightarrow \dfrac{7}{60} \times 2y = \dfrac{140}{1000}$

$\therefore$ Speed of current = 0.6 km/hr.

94. (B) Let the speed of stream = y km/hr
A.T.Q,
Relative speed = $16 + y + 20 - y = 36$ km/hr

$\therefore$ Required time = $\dfrac{144}{36}$ = 4 hours

95. (D) A.T.Q,
Increase in age in three years
= 5 × 3 = 15 years
$\therefore$ Required difference = 15 years

96. (C) Maximum difference was in 2003
= 450 – 325 = 125

97. (A) Required percentage

$= \dfrac{600}{(325 + 300 + 575)} \times 100$

$= \dfrac{600}{1200} \times 100 = 50\%$

98. (C) In 2002, increase percentage is maximum which was

$= \dfrac{250 - 120}{120} \times 100$

$= \dfrac{1300}{120}\% = 108\%$ (approx)

99. (C) Required difference = $\dfrac{1}{6}[200 + 300 + 450$

$+ 350 + 600 + 300 - 120 - 250 - 325 - 300 - 575 - 450] = 30$ lakh

100. (C) In 2003, maximum profit was earn
= 450 – 325 = 125 lakh

SSC TIER II (MATHS) MOCK TEST - 34 (ANSWER

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

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. Join the group and you may also share your suggestions and experience of Sunday Mock

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