SSC TIER II (MATHS) MOCK TEST - 21 (SOLUTION)

1. (C) Let, total no. of students = x
   Total present students

   $= \left(\dfrac{4x}{7} \times \dfrac{8}{9}\right) + \left(\dfrac{3x}{7} \times \dfrac{3}{5}\right)$

   $\Rightarrow \dfrac{241}{315} x$

   Required fraction $= \dfrac{241x}{315} \times \dfrac{1}{x}$

   $= \dfrac{241}{315}$

2. (B) $10 \times 20 \times 30 \times 40 \times 50 \times 60 \times 70 \times 80 \times 90 \times 100 \times 110$
   12 zero, and one more zero when the '5' in 50 will be multiplied by any '2'

3. (B) Let, number of friends who attended picnic = x
   According to the question,

   $\dfrac{10800}{x} - \dfrac{10800}{x+20} = 18$
   $\Rightarrow x = 100$

4. (D) According to the question

   $\dfrac{2}{5}\left(\dfrac{13}{4}\right) - \dfrac{3}{5}\left(\dfrac{7}{3} - \dfrac{7}{4}\right)$

   $= \dfrac{13}{10} - \dfrac{7}{20}$

   $= \dfrac{19}{20}$

5. (D) $\dfrac{1}{\sqrt{3}+\sqrt{5}} + \dfrac{1}{\sqrt{5}+\sqrt{7}} + \dfrac{1}{\sqrt{7}+\sqrt{9}} + \dfrac{1}{\sqrt{9}+\sqrt{11}}$

   $+ \dfrac{1}{\sqrt{11}+\sqrt{13}}$

   $= \dfrac{\sqrt{5}-\sqrt{3}}{2} + \dfrac{\sqrt{7}-\sqrt{5}}{2} + \dfrac{\sqrt{9}-\sqrt{7}}{2} +$

   $\dfrac{\sqrt{11}-\sqrt{9}}{2} + \dfrac{\sqrt{13}-\sqrt{11}}{2}$

   $= (\sqrt{5}-\sqrt{3}+\sqrt{7}-\sqrt{5}+\sqrt{9}-\sqrt{7}+\sqrt{11}-\sqrt{9}+\sqrt{13}-\sqrt{11})$

   $\dfrac{(\sqrt{5}-\sqrt{3}+\sqrt{7}-\sqrt{5}+\sqrt{9}-\sqrt{7}+\sqrt{11}-\sqrt{9}+\sqrt{13}-\sqrt{11})}{}$

   $= \dfrac{\sqrt{13}-\sqrt{3}}{2}$

6. (D) LCM of 45, 60, 90 and 105 is 1260
   So they all ring together after 1260 minutes i.e. 21 hours, at 9 A.M.

7. (C) $125^{\sin\theta} \times 625^{\cos\theta}$
   $= 5^{3\sin\theta} \times 5^{4\cos\theta}$
   $= 5^{3\sin\theta + 4\cos\theta}$
   Minimum value of $3\sin\theta + 4\cos\theta$
   $= -\sqrt{3^2 + 4^2} = -5$
   Minimum value of $5^{3\sin\theta + 4\cos\theta}$
   $= 5^{-5}$
   $= \dfrac{1}{3125}$

8. (B) If $\tan(x+2y) \cdot \tan(x-2y) = 1$,
   then, $(x+2y) + (x-2y) = 90°$
   $\Rightarrow x = 45°$

   Now, $(\sin x + \sec x) = \dfrac{1}{\sqrt{2}} + \sqrt{2} = \dfrac{3}{\sqrt{2}}$

9. (C) $(x+3)^2 + \dfrac{1}{(x+3)^2} = \left[(x+3) + \dfrac{1}{(x+3)}\right]^2 - 2$

   $= \left(\dfrac{x^2 + 9 + 6x + 1}{x+3}\right)^2 - 2$

   $= \left(\dfrac{(x^2 + x) + 5x + 10}{(x+3)}\right)^2 - 2$

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

   $= 23$

10. (C) $x + \dfrac{1}{y} = 1 \Rightarrow xy + 1 = y$ — (i)

    $y + \dfrac{1}{Z} = 1 \Rightarrow yz + 1 = z$ — (ii)

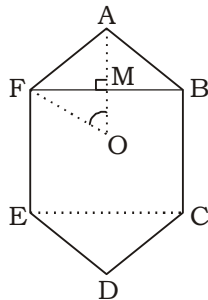   Putting the value of y from equation (i), in equation (ii)
    $(xy+1)z + 1 = z$
    $xyz = -1$

11. (D) $\dfrac{1}{1-a} + \dfrac{1}{1-b} + \dfrac{1}{1-c} = 1$

    subtract "3" from both sides,

    $\Rightarrow \dfrac{1}{1-a} - 1 + \dfrac{1}{1-b} - 1 + \dfrac{1}{1-c} - 1 = 1 - 3$

    $\Rightarrow \dfrac{a}{1-a} + \dfrac{b}{1-b} + \dfrac{c}{1-c} = (-2)$

12. (B)

ΔAOF is an equilateral triangle

$$FM = \frac{FB}{2} = \frac{\sqrt{3}a}{2}$$

$FB = \sqrt{3}\,a$

Area of ▱ FBCE = FB × BC

$$= \sqrt{3}a \times a = \sqrt{3}a^2 \text{ m}^2$$

13. (D) Let Front wheel complete 'x' revolutions
According to the question,
$(2\pi \times 72) \times x = (2\pi \times 60)(x + 10)$
$\Rightarrow 72x - 60x = 600$
$\Rightarrow x = 50$
∴ Distance covered $= 2 \times \pi \times 72 \times 50$
$= 7.2\,\pi$ km.

14. (A) In 3 hours, angle formed by hour hand
= 90°

∴ Area of sector $= \pi \times r^2 \times \dfrac{90°}{360°}$

$$= \frac{22}{7} \times 7 \times 7 \times \frac{1}{4}$$

$= 38.5$ m^2

15. (D) Let he sell 'x' pens
Total C.P. = $30x$
To gain 50%, Total S.P.

$$= 30x \times \frac{150}{100} = 45x$$

$3 + 6 + 9 + \dots\, 3x = 45x$

$\Rightarrow 3(1 + 2 + 3 + \dots x) = 45x$

$$\Rightarrow \frac{3x(x+1)}{2} = 45x$$

$\Rightarrow x + 1 = 30$

$\Rightarrow x = 29$

Hence, Required number of pens = 29

16. (c) $\dfrac{\cos\alpha}{\sin\beta} = n$, and $\dfrac{\cos\alpha}{\cos\beta} = m$

$\Rightarrow \cos^2\alpha = n^2 \sin^2\beta,\ \cos^2\alpha = m^2 \cos^2\beta$

Now, $n^2 \sin^2\beta = m^2 \cos^2\beta$

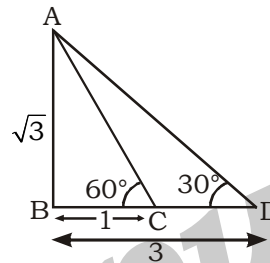$n^2(1 - \cos^2\beta) = m^2 \cos^2\beta$

$$\frac{n^2}{m^2 + n^2} = \cos^2\beta$$

17. (A) Minimum value of $6\sin x + 8\cos x$
$= -\sqrt{6^2 + 8^2} = -10$
So, P Must be ≥ 10

18. (B) $\sin(75)° = \sin(45° + 30°)$
$= \sin 45° \cos 30° + \cos 45° \sin 30°$

$$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \times \frac{1}{2}$$

$$= \frac{\sqrt{3} + 1}{2\sqrt{2}}$$

19. (D) If $\sin\theta + \text{cosec}\,\theta = 2$
then, $\sin\theta = 1$, $\text{cosec}\,\theta = 1$
∴ $\sin^{14}\theta + \text{cosec}^{34}\theta = 2$

20. (B)

A.T.Q,
Time taken by car to cover 2 units distance = 20 min.
Time taken by car to cover 3 units distance $= \dfrac{20}{2} \times 3 = 30$ min.

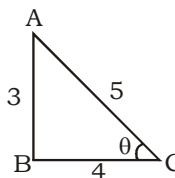∴ Required time $= \dfrac{30}{60} = \dfrac{1}{2}$ hours

21. (A) We know that,
$\Rightarrow \sec^2\theta - \tan^2\theta = 1$
$\Rightarrow (\sec\theta - \tan\theta)(\sec\theta + \tan\theta) = 1$

$\Rightarrow \sec\theta + \tan\theta = \dfrac{1}{2}$ ...... (i)

$\sec\theta - \tan\theta = 2$ .... (ii)
On solving equation (i) and (i), we get

$\sec\theta = \dfrac{5}{4}$

Now, $\sin\theta + \cos\theta = \dfrac{7}{5}$

22. (D) $x = (1+\cos A)(1+\cos B)(1+\cos C) = (1-\cos A)(1-\cos B)(1-\cos C)$ .... (given)
Now, $x^2 = (1+\cos A)(1+\cos B)(1+\cos C)(1-\cos A)(1-\cos B)(1-\cos C)$
$\Rightarrow x^2 = (1-\cos^2 A)(1-\cos^2 B)(1-\cos^2 C)$
$\Rightarrow x^2 = \sin^2 A \sin^2 B \sin^2 C$
$\Rightarrow x = \sin A \sin B \sin C$

23. (C) We know that $\cos 90° = 0$
So, $\cos 10° \cos 20° \cos 30° \cos 40° .....$
$\cos 110° \sin 120° = 0°$

24. (D) $x = 31 - 8\sqrt{15} = \left(4 - \sqrt{15}\right)^2$

$\Rightarrow \sqrt{x} = 4 - \sqrt{15}$ and $\dfrac{1}{\sqrt{x}} = 4 + \sqrt{15}$

Now, $\sqrt{x} + \dfrac{1}{\sqrt{x}} = 8$

25. (C) $x^2 + y^2 + 4y + 4 = 0$
$\Rightarrow x^2 + (y + 2)^2 = 0$
$\Rightarrow x = 0$, and $y = -2$
Now, $x^3 + y^3 = 0^3 + (-2)^3 = -8$

26. (C) Let the total no. of sides $= n$
According to the question,

$\dfrac{(n-2)180°}{n} - \dfrac{360°}{n} = 120°$

$\Rightarrow 180n - 360 - 360 = 120\,h$
$\Rightarrow 60n = 720$, $h = 12$
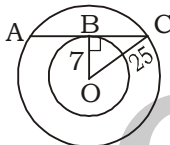$\Rightarrow n = 12$
Hence, Required number of sides = 12.

27. (B) ATQ,
$\Rightarrow$ In $\Delta BOC = 12$

$BC = \sqrt{oc^2 - OB^2}$

$\Rightarrow BC = 25^2 - 7^2$
$= 24$ cm
and, $AC = 2BC = 48$ cm

28. (C) Required percentage $= \dfrac{36}{40 \times 60} \times 100$
$= 1.5\,\%$

29. (C) If selling price increase by ₹4, 2 less chair will be sold

If selling price is x, $\dfrac{x - 200}{2}$ less chair will be sold.

Total chair sold $= 100 - \dfrac{x}{2} - 100$

$= 200 - \dfrac{x}{2} = \dfrac{400 - x}{2}$

30. (B) $AM \times MB = CM \times MD$
$\Rightarrow 6 \times 4 = 12 \times MD$
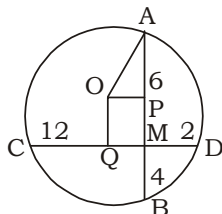$\Rightarrow MD = 2m$
Now,

$QD = \dfrac{12 + 2}{2} = 7$ m,

$QM = 5$ m $= OP$

and, $AP = \dfrac{AB}{2} = 5$ m

In ΔAOP,
$OA^2 = AP^2 + OP^2$

$\Rightarrow OA = \sqrt{5^2 + 5^2} = 5\sqrt{2}m$

Hence, Area of circle $= \pi\left(5\sqrt{2}\right)^2 = 50\,\pi\,m^2$

31. (A)
Man – 4
Woman – 6 $\begin{matrix} 4 \\ \end{matrix}\begin{matrix} 6 \\ 24 \\ 1 \end{matrix}$
Boy – 24

To complete the work in $\dfrac{1}{5}$ days, they have to do 120 unit work in a day.
Now, $4 + 6 + x = 120$
$\Rightarrow x = 110$ boys

32. (B) $\dfrac{M_1 D_1}{W_1} = \dfrac{M_2 D_2}{W_2}$

$\dfrac{42 \times 56}{2} = \dfrac{x \times 28}{3}$

$x = 126$

Required number of men = 126 – 56 = 70

33. (C) Akash complete $\dfrac{11}{18}$ the work = 22 days

Akash complete total work $= \dfrac{22 \times 18}{11}$
$= 36$ days

34. (C) Pipe$_1 \to 9$ $\begin{matrix} 2 \\ 18 \\ 3 \end{matrix}$
Pipe$_2 \to 6$

Required time $= \dfrac{18}{(3 - 2)} \times \dfrac{5}{6}$
$= 15$ hours

35. (D) Boy   Man
3          $1 \to$ efficiency
The wages will be in the ratio same as efficiency

Required wages of man $= \dfrac{1600}{4} \times \dfrac{1}{4}$
$= ₹100$

36. (C) According to the question
$3A = 7B$
and, $5B = 9C$
$15A = 35B = 63C$

Required time $= \dfrac{63}{15} \times 25 = 105$ days

37. (A) For maximum profit, S.P. must be maximum and C.P. must be minimum
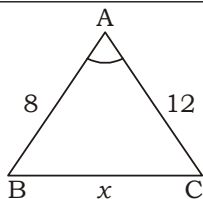$\therefore$ Maximum profit $= 424 \times 10 - 212 \times 10$
$= ₹ 2120$

38. (B) Loss required $= \dfrac{x^2}{100}\% = \dfrac{(20)^2}{100} = 4\%$

39. (D) Let cost price per watch $= x$
According to the question

$x \times \dfrac{160}{100} \times \dfrac{80}{100} = \dfrac{6912}{108}$

$\Rightarrow x = ₹50$

40. (D)

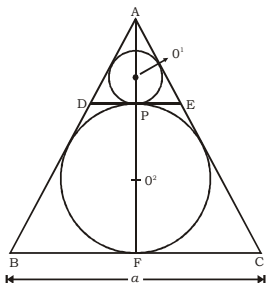Area of a triangle = $\dfrac{1}{2} \times 8 \times 12 \times \sin \angle BAC$

Max. value of $\sin \angle BAC = 1$

$\therefore \angle BAC = 90°$,

So, $x = \sqrt{8^2 + 12^2} = \sqrt{208}$

41. (C)

ABC is an equilateral triangle

AF : $\dfrac{\sqrt{3}a}{2}$

In-radius (R_1) = $\dfrac{a}{2\sqrt{3}}$

AP = AF – $2R_1$

= $\dfrac{\sqrt{3}a}{2} - \dfrac{a}{\sqrt{3}} = \dfrac{a}{2\sqrt{3}}$

Δ ADE is also an equilateral triangle

$\dfrac{\sqrt{3}\,DE}{2} = AP = \dfrac{a}{2\sqrt{3}}$

DE = $\dfrac{a}{3}$

Inradius of triangle ADE

= $\dfrac{DE}{2\sqrt{3}} = \dfrac{a}{6\sqrt{3}}$

42. (C) Circumradius (R) = $\dfrac{\text{hypstenuse}}{2}$

hypotenuse (h) = 11 × 2 = 22 cm

Inradius (r) = $\dfrac{a+b-h}{2}$, (a & b are sides of triangle)

$4 = \dfrac{a + b - 22}{2}$

$\Rightarrow a + b = 30$ cm and,

Perimeter = a + b + h = 30 + 22 = 52 cm

43. (B) $x^2 - 14x + 34 \Rightarrow (x - 7)^2 + 34 - 49$

$\Rightarrow (x - 7)^2 - 15$

minimum value of $(x - 7)^2 = O$

So, minimum value = –15

44. (B) $\dfrac{1434}{0.1434} = \dfrac{14.34}{x}$

$\Rightarrow x = \dfrac{1434}{1000000} = 0.001434$

45. (C) $x^{x\sqrt{x}} = \left(x\sqrt{x}\right)^x$

$\Rightarrow x^{x\sqrt{x}} = \left(x^{\frac{3}{2}}\right)^x$

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

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

$\Rightarrow x = \dfrac{9}{4}$

46. (C) $x = \sqrt{11} + \sqrt{10}$, $\dfrac{1}{x} = \sqrt{11} - \sqrt{10}$

and, $x + \dfrac{1}{x} = 2\sqrt{11}$

Now, $x^3 + \dfrac{1}{x^3} = \left(2\sqrt{11}\right)^3 - 3 \times \left(2\sqrt{11}\right)$

$= 88\sqrt{11} - 6\sqrt{11}$

$= 82\sqrt{11}$

47. (C) $x + \dfrac{1}{x} = 3$

$x^5 + \dfrac{1}{x^5} = (3^3 - 3\times3)(3^2 - 2) - 3$

$= 18 \times 7 - 3 = 123$

48. (C) Let he has "x" rupees

According to the question,

$x = 50$ A = 40 M (A = apple, M = Mango)

$x = \dfrac{10x}{100} + \dfrac{20 \times x}{40} + P \times \dfrac{x}{50}$

[P = total apple purchase)

$\Rightarrow$ P = 20.

49. (B) Let the number = 100

after decreasing by M% = 100 – M

Required percentage = $\dfrac{M}{100 - M} \times 100$

= $\dfrac{100M}{100 - M}$

50. (B) Boy : Girl

    5 : 7

Required percentage

$$= \left(\frac{\frac{5x \times 40}{100} + \frac{7x \times 60}{100}}{12x} \right) \times 100$$

$$= 51.56$$

51. (A) Let the numbers are x and y

According to the question,

$$x - y = \frac{30}{100}(x + y)$$

$\Rightarrow 10x - 10y = 3x + 3y$

$\Rightarrow 7x = 13y$

$\Rightarrow x{:}y = 13{:}7$

52. (C) On Earth, water = 80, Land = 20

In Asia (40)	In Rest of the world (60)
Water – 28	Water = 80 – 28 = 52
Land –12	Land = 20 – 12 = 8

Required Ratio   = 8 : 52

             = 2 : 13

53. (D) Let, normal speed = x km/h and normal time = T hours

According to question,

$$\frac{120}{T-2} - \frac{120}{T} = 10$$

$\Rightarrow$ T = 6 hours

$\therefore x = \frac{120}{6} = 20$ km/hr

54. (B) Let, they meet after time 'T' minute

T = $\sqrt{63} \times \sqrt{28}$

  = 2 × 3 × 7 = 42 minutes

Required time = 42 + 28 = 70 minutes

55. (C) Speed of car = $\frac{M}{N}$ km/hr

Required time = $\frac{700 \times N}{1000 \times M}$ = $\frac{7N}{10M}$ hrs.

56. (C) Let speed of stream = x km/hr

Required time = $\dfrac{192}{(15+x)+(17-9x)}$

$$= \frac{192}{32}$$

  = 6 hours

57. (D) Let, speed = x km/hr and time = y hrs

According to the question,

$$xy = (x + 3)\left(y - \frac{2}{3}\right)$$

$\Rightarrow xy = xy + 3y - \frac{2}{3}x - 2$

$\Rightarrow 9y - 2x = 6 - $ (i) and

$$xy = (x{-}2)\left(y + \frac{2}{3}\right)$$

$\Rightarrow xy = xy - 2y + \frac{2}{3}x - \frac{4}{3}$

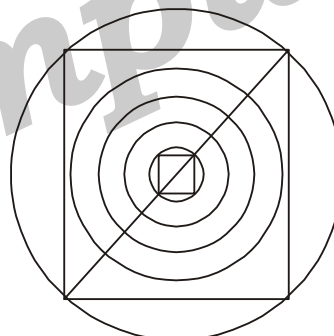$\Rightarrow -6y + 2x = 4 - $ (ii)

From (i) and (ii), we have

$$y = \frac{10}{3}, x = 12$$

$\therefore$ Distance = xy = $\frac{10}{3} \times 12$ = 40 km.
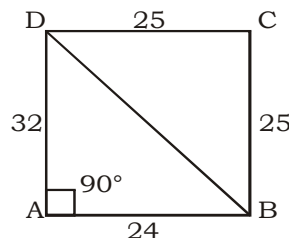
58. (B)

Diagonal of innermost square = $\sqrt{50} \times \sqrt{2}$ =10cm

Diagonal of outermost square = 10 + (2.25) × 8 = 28 cm.

59. (D)

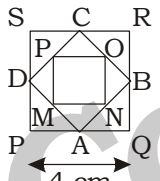Area of Δ ABD = $\frac{1}{2} \times 32 \times 24$ = 384 m²

BD = $\sqrt{24^2 + 32^2}$ = 40.

Area of ΔBCD = $\sqrt{45 \times 5 \times 20 \times 20}$

         = 3 × 5 × 20

         = 300 m²

Hence, Area of ΔBCD = 300 + 384

              = 684 m²

60. (A) Let the side of cube = a
According to the question,
$\Rightarrow$ $4 \times 6 \times 9 = a^3$
$\Rightarrow$ $a = 2 \times 3 = 6$

$\therefore$ Required ratio = $\dfrac{2(4 \times 6 + 6 \times 9 + 4 \times 9)}{6 \times (6)^2}$

= 228:216
= 19 : 18

61. (B) Let height of cone = h
According to the question

$\pi R^2 \times 17 = \dfrac{1}{3} \times \pi R^2 \times h$

$\Rightarrow$ h = 51 cm.

62. (D) Total surface area of prism

= $(6 \times 3) \times 5 + \left(\dfrac{\sqrt{3} \times (6)^2}{4}\right) \times 2$

= $90 + 18\sqrt{3}$

= $18 (5 + \sqrt{3})$ cm^2

63. (B) AD = $\sqrt{(2)^2 + (2)^2}$

= $2\sqrt{2}$ cm

Area of $\square$PQRS = 16 cm^2

and, Area of $\square$ABCD = $\left(2\sqrt{2}\right)^2$ = 8 cm^2

PM = $\sqrt{(PD)^2 + (MD)^2}$

= 2 cm
Area of $\square$MNOP = 2^2 = 4 cm^2
Hence, total area = 16 + 8 + 4 + 2 + 1

.... = $\dfrac{16}{1 - \dfrac{1}{2}}$ = 32cm^2

64. (B)

65. (D) Let $x = 11^3 + 12^3 + 13^3 + ... + 15^3$

$\Rightarrow x = \left(\dfrac{15(15+1)}{2}\right)^2 = (120)^2 = 14400$

and, $y = 1^3 + 2^3 + 3^3 + ... + 10^3 = y$

$\Rightarrow y = \left(\dfrac{10(11)}{2}\right)^2 = (55)^2 = 3025$

Now, Required sum = $x - y$ = 14400 − 3025
= 11375

66. (C) Let the cost price = ₹100
then, Selling price = ₹140

Required Fraction = $\dfrac{100}{140} = \dfrac{5}{7}$

67. (C) Let required rate = R%
According to the question,

$16000 \times \dfrac{11}{200} + 48000 \times \dfrac{6}{100} + 36000 \times \dfrac{R}{100}$

= 7360
$\Rightarrow$ 880 + 2880 + 360R = 7360
$\Rightarrow$ 360 R = 3600
$\Rightarrow$ R = 10%

68. (C) Let the money borrowed = ₹ P

$P \times \dfrac{9}{100} \times 2 + P \times \dfrac{15}{100} \times 3 + P \times \dfrac{13}{100} \times 3$

= 8160
$\Rightarrow$ P = ₹ 8000

69. (C) Sum of money = $\dfrac{100 \times 100}{10 \times 10} \times 28$ = ₹ 2800

Compound interest (half-yearly)

= $2800 \left(1 + \dfrac{5}{100}\right)^4$

= ₹ 603.41

Simple interest = $\dfrac{2800 \times 2 \times 10}{100}$ = ₹ 560

$\therefore$ Required Difference = ₹ 603.41−560
= ₹ 43.41

70. (B) Let required amount = ₹ x
According to the question

$36900 = \left(\dfrac{20}{21} + \left(\dfrac{20}{21}\right)^2\right) x$

$\Rightarrow 36900 = x\left(\dfrac{20}{21} + \dfrac{420}{441}\right)$

$\Rightarrow x = ₹19845$

71. (B)

	Zinc : Copper : tin	Zinc : Copper : tin : lead
1st alloy →	3 : 4 : 6 $\xrightarrow{\times 2}$	6 : 8 : 12
2nd alloy →		7 : 9 : 10

Required weight = $\dfrac{10}{52} = \dfrac{5}{26}$ kg.

72. (B) Let total mixture = 8 units
Initially, water = 3 units
milk = 5 units
Finally, water = 4
milk = 4
Let 'x' unit of mixture was taken off

$3 - \dfrac{3x}{8} + x = 4$

$x = \dfrac{8}{5}$ unit

Required fraction = $\dfrac{8}{5} \times \dfrac{1}{8} = \dfrac{1}{5}$ part

73. (D) Let $p = r = t = 3$

$q = s = u = 5$

$$\frac{ap + br + ct}{aq + bs + cu} = \frac{3(a+b+c)}{5(a+b+c)} = 3:5$$

74. (D) Let, required number = x

$(6+x)(17+x) = (7+x)(15+x)$

$\Rightarrow x = 3$

75. (D) Let, there are x, y and z students in 8th, 9th, and 10th class respectively.

$$\frac{53x + 46y}{x + y} = 49$$

$\Rightarrow 53x + 46y = 49x + 49x$

$\Rightarrow 4x = 3y$ .....(i)

$$\frac{46y + 55z}{y + z} = 51$$

$\Rightarrow 46y + 55z = 51y + 51z$

$\Rightarrow 5y = 4z$ .....(ii)

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

$20x = 15y = 12z$

$x : y : z = 3 : 4 : 5$

Required average weight

$$= \frac{53 \times 3 + 46 \times 4 + 55 \times 5}{3 + 4 + 5}$$

$$= \frac{159 + 184 + 275}{12}$$

$$= \frac{618}{12} = 51.5 \text{ kg.}$$

76. (D) Required average $= \dfrac{38 \times 7 - 8 \times 7}{6}$

$$= \frac{266 - 56}{6}$$

$$= \frac{210}{6} = 35 \text{ years}$$

77. (C) Sum of all four numbers = $27 + (23 \times 3)$

$= 96$

Last number $= 96 - (3 \times 21)$

$= 33$

78. (A) $\dfrac{m + (m+1) + (m+2) + (m+3) + (m+4)}{5} = h$

$\Rightarrow 5m + 10 = 5h$

$\Rightarrow m + 2 = h - (i)$

Required average

$$= \frac{(m+2) + (m+3) + (m+4) + (m+5) + (m+6)(m+7)}{6}$$

$$= \frac{6m + 27}{6}$$

$$= \frac{m + 27}{6}$$

$$= (h-2) + \frac{27}{6} \quad \text{(from equation (i))}$$

$$= \frac{2h + 5}{2}$$

79. (C) Required average

$$= \frac{\begin{array}{c}2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 \\ +23 + 29 + 31 + 37 + 41 + 43 + 47\end{array}}{15}$$

$$= \frac{328}{15} = 21.86$$

80. (C) $(x^2 + 7x + 12) = (x+4)(x+3)$

Sides of rectangle are $(x+4)$ and $(x+3)$

$\therefore$ Perimeter $= \big(2(x+4) + 2(x+3)\big)$

$= (4x + 14)$ cm

81. (C) Required Volume $= 3.5 \times 10{,}000 \times \dfrac{10}{100}$

$= 3500$ m³

82. (A) Area $= \dfrac{1}{2} \times AB \times AC$

$$= \frac{1}{2} \times (BC. \sin 15°)(BC. \cos 15°)$$

$$= \frac{1}{2} \times \frac{1}{2} \times BC \times BC \times 2 \sin 15° \cos 15°$$

$$= \frac{1}{4} \times 10 \times 10 \times \sin 30°$$

$$= 25 \times \frac{1}{2} = 12.5 \text{m}^2$$

$= 12.5 \times 100 \times 100 = 125000$ cm²

83. (C) SP of racket $= \left(\dfrac{300 \times 85}{100} - 15\right)$

$= ₹ 240$

C. P $= \dfrac{240 \times 100}{120} = ₹ 200$

84. (B) Simple interest per year $= \dfrac{6000}{3}$

$= ₹ 2000$

Let rate = R%

$2000 \times \dfrac{R}{100} = 100$

$\Rightarrow R = 5\%$

Let sum = ₹ P

$P \times \dfrac{5}{100} = 2000$

$\Rightarrow P = ₹ 40{,}000$

85. (A) C.P. of mixed tea $= 264 \times \dfrac{100}{120} = ₹ 220$

```
   214            234
        \        /
          220
        /        \
   14              6
```

Required ratio = 14 : 6 = 7 : 3

86. (B) $\dfrac{P}{Q} = \dfrac{Q}{R}$, $\Rightarrow Q^2 = PR$

$\Rightarrow Q^4 = P^2 R^2$

$Q^4 \, Q^4 = P^4 R^4 \Rightarrow \dfrac{P^4}{Q^4} = \dfrac{Q^4}{R^4}$

$\Rightarrow P^2 : R^2$

87. (D) $\dfrac{M_1 D_1}{W_1} = \dfrac{M_2 D_2}{W_2}$

$\Rightarrow \dfrac{24 \times 24}{24} = \dfrac{8 \times x}{8}$

$\Rightarrow x = 24$ sec.

88. (C) Let A Contribute ₹ x

$\dfrac{x \times 4}{1560 \times 8} = \dfrac{1}{8} \times \dfrac{24}{13}$

$x = \dfrac{3 \times 1560 \times 8}{13 \times 4} = \dfrac{24 \times 120}{4}$

$x = ₹ 720$

Let B Contribute ₹ y

$\dfrac{y \times 6}{720 \times 4} = \dfrac{1}{3} \times \dfrac{8}{1}$

$y = \dfrac{8 \times 4 \times 720}{6 \times 3} = 32 \times 40$

₹ 1280

89. (A) 17 and 19 are co-prime numbers,
So the number must be divisible by 17 × 19.

90. (D) $\pi R^2 = 770$

$\Rightarrow R^2 = \dfrac{770 \times 7}{22} = 35 \times 7$

$\Rightarrow R = 7\sqrt{5}$

$\pi RL = 814$

$\Rightarrow L = \dfrac{814 \times 7}{22 \times 7\sqrt{5}} = \dfrac{37}{\sqrt{5}}$

and, $L^2 - R^2 = H^2$

$H = \dfrac{12}{\sqrt{5}}$

Volume $= \dfrac{1}{3} \times \dfrac{22}{7} \times 7\sqrt{5} \times 7\sqrt{5} \times \dfrac{12}{\sqrt{5}}$

$= 616 \sqrt{5} \text{ cm}^3$

91. (C) Required percentage

$= 100 \times \dfrac{\left(3276000 \times \frac{15}{100} \times \frac{3}{5}\right) + \left(3276000 \times \frac{20}{100} \times \frac{3}{4}\right) + \left(3276000 \times \frac{12}{100} \times \frac{3}{8}\right)}{3276000}$

$= \dfrac{933660}{3276000} \times 100 = 28.5\%$

92. (D) Required number

$= \left(3276000 \times \dfrac{25}{100} \times \dfrac{7}{9}\right) + \left(3276000 \times \dfrac{20}{100} \times \dfrac{4}{5}\right)$

$= 637000 + 524160$

$= 1161160$

93. (D) Required ratio

$= \dfrac{3276000 \times \frac{9}{100} \times \frac{4}{7}}{3276000 \times \frac{8}{100} \times \frac{3}{5}}$

$= \dfrac{9 \times 4 \times 5}{7 \times 8 \times 3} = \dfrac{15}{14}$

94. (B) Required number $= 3276000 \times \dfrac{15}{100} \times \dfrac{3}{5}$

$= 294840$

95. (A) Required Ratio $= \dfrac{3276000 \times \frac{15}{100} \times \frac{100}{110}}{3276000 \times \frac{20}{100} \times \frac{100}{112}}$

$= \dfrac{15 \times 112}{20 \times 110} = 42 : 55$

96. (B) Required ratio $= \dfrac{12699}{92} \approx 138$

97. (A) Countries B, C and F exhibited a trade surplus.

98. (B) Total export $= 28819$ Lakhs
Total import $= 43431$ Lakhs
deficit $= 43431 - 28819$
$= 14612$ Lakhs

99. (A) The Highest trade deficit shown by country A
$= 12699 - 6045 = 6654$ lakh

100. (B) In country 'c' the ratio of export to import is the highest

SSC TIER II (MATHS) MOCK TEST - 21 (ANSWER KEY)

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