

SSC PRE MOCK TEST – 31 (SOLUTION)

1. (A) Magazine is related to editor and drama is related to director.

2. (C) As, ACEG IKMO
 $\xrightarrow{+8}$

Similarly, OSUW YACE
 $\xrightarrow{+8}$

3. (A) $12 \Rightarrow (12 + 1) \times 3 = 39$
 $15 \Rightarrow (15 + 1) \times 3 = 48$

4. (B) Except 'Battery', others are used for lightning purpose.

5. (D) $CA \Rightarrow 3 - 1 = 2$

$FD \Rightarrow 6 - 4 = 2$

$KI \Rightarrow 11 - 9 = 2$

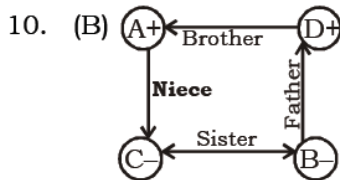
TQ $\Rightarrow 20 - 17 = 3$

6. (D) $\begin{matrix} 73 & 61 & 57 & 69 & 47 & 59 & 42 & 29 \\ \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow & \uparrow \\ 12 & 12 & 12 & 12 & 12 & 12 & 13 & 13 \end{matrix}$

7. (D) Scarf \rightarrow Scene \rightarrow Shell \rightarrow Stream \rightarrow Survey.

8. (A) DCB HGF LKJ PON
 $\xrightarrow{+4}$ $\xrightarrow{+4}$ $\xrightarrow{+4}$

9. (A) $\begin{matrix} 4 & 9 & 16 & 25 & 36 & 49 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ 2^2 & 3^2 & 4^2 & 5^2 & 6^2 & 7^2 \end{matrix}$



11. (A) N R **O** P M

12. (C) S A L U T E

13. (A) SUN = 19 + 21 + 14 = 54

CAKE = 3 + 1 + 11 + 5 = 20

MISTAKE = 13 + 9 + 19 + 20 + 1 + 11 + 5 = 78

14. (C) $128 + 9 - 16 \times 4$

After changing the signs as per the given details,

$$\begin{aligned} 128 \times 9 + 16 \div 4 &= 128 \times 9 + 4 \\ &= 1152 + 4 \\ &= 1156 \end{aligned}$$

15. (D) As, $6 \times 2 \times 9 \Rightarrow 269$,

a b c bac

$8 \times 7 \times 1 \Rightarrow 781$

a b c bac

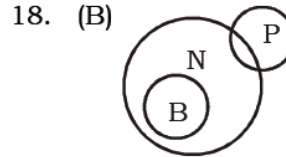
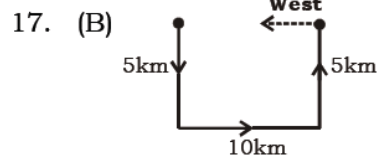
Similarly, $4 \times 1 \times 3 \Rightarrow 143$

a b c **bac**

16. (C) $9 \times 3 \times 3 = 81$

$11 \times 4 \times 4 = 176$

$13 \times 7 \times 5 = 455$

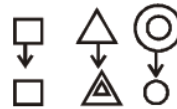


I. \times

II. \checkmark

\therefore Only conclusion II follows.

19. (B) From figure (i) and (iii), we have,

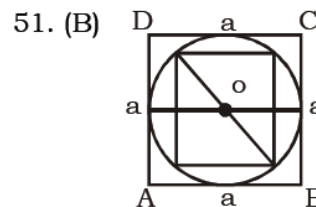


\therefore The face opposite to "O" is

20. (B) 21. (B) 22. (B) 23. (A) 24. (C)

25. (B) S E N T

22 32 65 78



Let the side of the original square = x unit
 So, area of this square = x^2 unit²

\therefore Diameter of circle = x unit
 Now, the diagonal of square cut from this circle = x unit

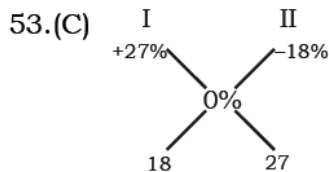
So, the side of this square = $\frac{x}{\sqrt{2}}$ unit

Area of this final square = $\frac{x^2}{2}$ unit²

Required area = $\frac{x^2}{2} \times 100 = 50\%$

Therefore, the area of the new square will be **50%** of the area of the original square.

52.(C) When $(x^5 - 3x^4 + x^3 + 5x - 1)$ divided by $(x-2)$
 Remainder = $2^5 - 3 \times 2^4 + 2^3 + 5 \times 2 - 1$
 $= 32 - 48 + 8 + 10 - 1$
 $= 1$



Ratio of the C.P. = $18 : 27 = 2 : 3$

ATQ,

5 units \longrightarrow 800

1 unit \longrightarrow 160

C.P. of the Ist article = ₹ 320

C.P. of the IInd article = ₹ 480

The S.P. of the IInd article = $480 \times \frac{82}{100}$
 $= \text{₹}393.6$

54.(A) Let they meet after t hour.

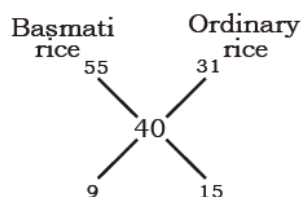
ATQ,

time (t) = $\frac{835}{150+50} = \frac{835}{200}$ hours

\therefore Lines written by Ist boy = $150 \times \frac{835}{200}$
 $= \frac{2505}{4} = 626 \frac{1}{4}$ lines

Therefore, they meet at **627th** line.

55.(D) C.P. of the total mixture = $50 \times \frac{100}{125}$
 $= \text{₹}40$ per kg



Ratio of their quantity = $9 : 15$
 $= 3 : 5$

ATQ, 5 units = 25

1 unit = 5

So, the quantity of Basmati rice $3 \times 5 = 15$ kg

56.(B) Ram does 60% work in 12 days

He completes the whole work = $\frac{12 \times 100}{60}$
 $= 20$ days

Ram Atul Mayank

Efficiency - 4 : 2 : 1

Total work = $20 \times 4 = 80$ units

They complete rest 40% work = $\frac{80 \times \frac{40}{100}}{7}$

$= \frac{32}{7} = 4 \frac{4}{7}$ days

57.(C) Let the side of the square = a unit

ATQ,

Base perimeter of cylinder = Side of the square

$\Rightarrow 2\pi r = a$

$\Rightarrow \frac{r}{a} = \frac{1}{2\pi}$

$\Rightarrow r : a = 1 : 2\pi$

58.(D) Given that,

$a^2 - by - cz = ax - b^2 + cz = ax + by - c^2 = 0$

or $a^2 - by - cz = b^2 - ax - cz = c^2 - ax - by = 0$

Now we take,

$a^2 - by - cz = 0$

$\Rightarrow a^2 = by + cz$

$\Rightarrow a = \frac{by + cz}{a}$

$\Rightarrow a + x = \frac{by + cz + ax}{a}$

Similarly,

$b + x = \frac{by + cz + ax}{b}$

And, $c + x = \frac{by + cz + ax}{c}$

Now, $\frac{x}{a+x} + \frac{y}{b+y} + \frac{z}{c+z} = \frac{ax}{ax+by+cz}$

$+ \frac{by}{ax+by+cz} + \frac{cz}{ax+by+cz}$

$= \frac{ax+by+cz}{ax+by+cz} = 1$

59. (C) Let the original speed of the cyclist = x km/h

We have,

Distance = $\frac{S_1 \times S_2}{(S - S_2)} \times \text{time}$

$\Rightarrow 52 = \frac{x \times (x-1)}{1} \times \frac{20}{60}$

$\Rightarrow x(x-1) = 52 \times 3$

$\Rightarrow x(x-1) = 13 \times 12$

$\Rightarrow x = 13$

So, the original speed will be **13 km/h**

60. (A) Given number

$$N = 90 \times 66 \times 441 \times 324 \times 77$$

$$N = 3^2 \times 10 \times 3 \times 22 \times 3^2 \times 49 \times 3^4 \times 4 \times 77$$

$$N = 3^9 \times 10 \times 22 \times 49 \times 4 \times 77$$

∴ This number N is divisible by 3^n . So n should be **9**

61. (C) ATQ,

$$\text{Speed of B} = \frac{100}{10} = 10\text{m/sec}$$

$$\begin{aligned} \text{Time taken by B to cover 1000m race} &= \frac{1000}{10} \\ &= 100 \text{ sec} \end{aligned}$$

$$\begin{aligned} \therefore \text{Time taken by A to complete the race} \\ &= 100 - 10 = 90 \text{ sec} \end{aligned}$$

$$\text{Now, time taken by B till injured} = \frac{570}{10} = 57 \text{ sec}$$

And, time taken by B after he gets injured

$$= \frac{430}{5} = 86 \text{ sec}$$

$$\begin{aligned} \therefore \text{Total time taken by B} &= 57 + 86 = 143 \text{ sec} \\ \text{So, A beats B} &= 143 - 90 = \mathbf{53 \text{ sec}} \end{aligned}$$

62. (B) Given that

$$\frac{x}{a} - \frac{y}{b} \cot \theta = 1 \text{-----(i)}$$

$$\frac{x}{a} \cot \theta + \frac{y}{b} = 1 \text{-----(ii)}$$

By adding the square of equation (i) & (ii)

$$\begin{aligned} \frac{x^2}{a^2} + \frac{y^2}{b^2} \cot^2 \theta - \frac{2xy}{ab} \cot \theta + \frac{x^2}{a^2} \cot^2 \theta + \frac{y^2}{b^2} + \frac{2xy}{ab} \\ \cot \theta = 1 + 1 \end{aligned}$$

$$\Rightarrow \frac{x^2}{a^2} (1 + \cot^2 \theta) + \frac{y^2}{b^2} (1 + \cot^2 \theta) = 2$$

$$\Rightarrow \frac{x^2}{a^2} \operatorname{cosec}^2 \theta + \frac{y^2}{b^2} \operatorname{cosec}^2 \theta = 2$$

$$\Rightarrow \frac{x^2}{a^2} + \frac{y^2}{b^2} = \mathbf{2 \sin^2 \theta}$$

63. (A) $\sqrt{\frac{x}{y}} = 6 - \sqrt{\frac{y}{x}}$

$$\Rightarrow \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 6$$

$$\Rightarrow \frac{x+y}{\sqrt{xy}} = 6$$

$$\Rightarrow \frac{x^2 + y^2 + 2xy}{xy} = 36$$

Now we have, $x - y = 8$

$$x^2 + y^2 = 64 + 2xy$$

Now the expression becomes,

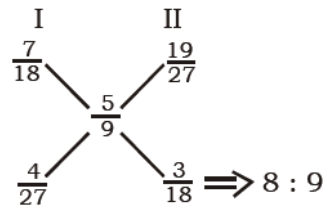
$$\frac{64 + 4xy}{xy} = 36$$

$$\Rightarrow \frac{64}{xy} = 36 - 4 = 32$$

$$\Rightarrow xy = \mathbf{2}$$

64. (D) ATQ,

$$55\frac{5}{9}\% = \frac{500}{900} = \frac{5}{9}$$



Required Ratio = 8 : 9

65. (A) $A \rightarrow \frac{32}{3} \text{ days}$ $\begin{matrix} \nearrow 9 \\ \searrow 10 \end{matrix} \rightarrow 96$
 $B \rightarrow \frac{48}{5} \text{ days}$

$$\text{Hence, required time} = \frac{96 - 9 \times 4}{10}$$

$$= \frac{60}{10} = \mathbf{6 \text{ days}}$$

66. (B) We know that,

$$\tan 3x = \tan(2x + x)$$

$$\Rightarrow \tan 3x = \frac{\tan 2x + \tan x}{1 - \tan 2x \times \tan x}$$

$$\Rightarrow \tan 3x - \tan 3x \cdot \tan 2x \cdot \tan x = \tan 2x + \tan x$$

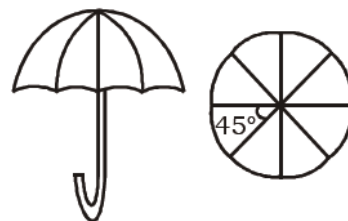
$$\therefore \tan 3x \cdot \tan 2x \cdot \tan x = \tan 3x - \tan 2x - \tan x$$

67. (C) $\frac{\sin \theta - 2 \sin^3 \theta}{2 \cos^3 \theta - \cos \theta} = \frac{\sin \theta (1 - 2 \sin^2 \theta)}{\cos \theta (2 \cos^2 \theta - 1)}$

$$= \frac{\sin \theta \cos 2\theta}{\cos \theta \cos 2\theta}$$

$$= \mathbf{\tan \theta}$$

68. (D)



∴ There are 8 ribs in an umbrella. The angle between two consecutive ribs

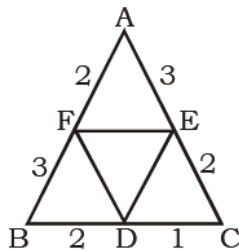
$$= \frac{360^\circ}{8} = 45^\circ$$

∴ Area between two consecutive ribs of the circle

$$= \frac{45^\circ}{360^\circ} \times \pi r^2$$

$$= \frac{1}{8} \times \frac{22}{7} \times 14 \times 14 = \mathbf{77 \text{ cm}^2}$$

69. (B)



Let $\triangle ABC$ is an equilateral triangle. So the ratio becomes.

$$\frac{BD}{DC} = \frac{2 \times 5}{1 \times 5} = \frac{10}{5} \quad (15)$$

$$\frac{AE}{EC} = \frac{3 \times 3}{2 \times 3} = \frac{9}{6} \quad (15)$$

$$\frac{AF}{FB} = \frac{2 \times 3}{3 \times 3} = \frac{6}{9} \quad (15)$$

∴ $AB = BC = CD = 15$ units

$$\begin{aligned} \text{Area of } \triangle ABC &= \frac{\sqrt{3}}{4} \times (15)^2 \\ &= \frac{\sqrt{3} \times 225}{4} \text{ unit}^2 \end{aligned}$$

Area of $\triangle DEF$ = Area of $\triangle ABC$ - (Area of $\triangle AFE$ + Area of $\triangle BDF$ + Area of $\triangle DCE$)

$$= \frac{\sqrt{3}}{4} \times 225 - \left(\frac{1}{2} \times 6 \times 9 \sin 60^\circ + \frac{1}{2} \times 10 \times 9 \sin 60^\circ + \frac{1}{2} \times 5 \times 6 \sin 60^\circ \right)$$

$$= \frac{\sqrt{3}}{4} \times 225 - \frac{1}{2} \times 174 \times \frac{\sqrt{3}}{2}$$

$$= \frac{51\sqrt{3}}{4} \text{ unit}^2$$

$$\begin{aligned} \therefore \text{ Required ratio} &= \frac{51\sqrt{3}}{4} : \frac{225\sqrt{3}}{4} \\ &= \mathbf{17 : 75} \end{aligned}$$

70. (C) Given that, $a + b + c = 0$

Let $a = 1$, $b = -1$ and $c = 0$

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

$$= \frac{1^2}{2 \times 1^2 + 0} + \frac{(-1)^2}{2 \times (-1)^2 + 0} + 0$$

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

$$71. (A) \quad y = \frac{1}{2 + \frac{1}{3 + \frac{1}{2 + \frac{1}{3 + \dots}}}}$$

$$\Rightarrow y = \frac{1}{2 + \frac{1}{3 + y}}$$

$$\Rightarrow y = \frac{3 + y}{2y + 7}$$

$$\Rightarrow 2y^2 + 7y = 3 + y$$

$$\Rightarrow 2y^2 + 6y - 3 = 0$$

$$\Rightarrow y = \frac{-6 \pm \sqrt{6^2 + 4 \times 2 \times 3}}{2 \times 2}$$

$$\Rightarrow y = \frac{-6 \pm \sqrt{60}}{4}$$

$$\Rightarrow y = \frac{-3 \pm \sqrt{15}}{2}$$

$$\text{or } y = \frac{\sqrt{15} - 3}{2} \quad (\text{As } y \text{ can't be negative})$$

$$72. (A) \text{ Required percentage} = \frac{211 - 138}{138} \times 100 = \mathbf{52.89\%}$$

73. (C) Bank 1, Bank 4 and Bank 5

$$74. (B) \quad I = \frac{265}{143} = 1.85$$

$$II = \frac{211}{109} = 1.93$$

∴ $I < II$

75. (C) Required average amount

$$= \frac{109 + 123 + 125 + 142 + 157}{5}$$

$$= \mathbf{131.2}$$

SSC PRE MOCK TEST – 31 (ANSWER)

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