KD Campus
KD Campus Pvt. Ltd
2007, OUTRAM LINES, 1ST FLOOR, OPPOSITE MUKHERJEE NAGAR POLICE STATION, DELHI-110009

SSC TIER II (MATHS) MOCK TEST - 30 (ANSWER KEY)

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

SSC TIER II (MATHS) MOCK TEST - 30 (SOLUTION)

1. (A) A.T.Q
Nearest number to 107252, which is divisible by 17 = 107253
Hence,
The number should be added is 1.

2. (B) Let the number is x.
A.T.Q
$x^3 - 25x = 1056$
Taking option (b)
$(11)^3 - 25(11) = 1056$
$\Rightarrow 1331 - 275 = 1056$
$\Rightarrow 1056 = 1056$
Hence, Required number is 11.

3. (C) A.T.Q

$$\frac{5}{6} = 0.8\overline{3}$$

$$\frac{8}{11} = 0.\overline{72}$$

$$\frac{7}{9} = 0.\overline{7}$$

$$\frac{15}{17} = 0.88$$

$\therefore$ Required order $= \frac{15}{17} > \frac{5}{6} > \frac{7}{9} > \frac{8}{11}$

4. (C) Let the first natural number = x
and, the second natural number = y
A.T.Q,
$85x + 34y$
and, $17(5x + 2y)$
It is multiple of 17.
$\therefore$ The number should be multiple of 17.
Hence, required number = 2754

5. (B) A.T.Q
r = 32 (given)
$\therefore$ d = 32 × 7 = 224

and, $q = \frac{224}{16} = 14$

dividend = (divisor × quotient) + remainder
$\Rightarrow$ Dividend = (224 × 14) + 32
$\Rightarrow$ Dividend = 3168

6. (D) A.T.Q

$$x = 5 + \frac{1}{\sqrt{5}} + \frac{1}{5+\sqrt{5}} + \frac{3}{\sqrt{5}-5}$$

$$\Rightarrow x = 5 + \frac{\sqrt{5}}{5} + \frac{5-\sqrt{5}}{20} - \frac{3\left(5+\sqrt{5}\right)}{20}$$

$$\Rightarrow x = \frac{100 + 4\sqrt{5} + 5 - \sqrt{5} - 3\sqrt{5} - 15}{20}$$

$$\Rightarrow x = \frac{90}{20} = \frac{9}{2}$$

7. (B) Let $P = (x + y)^3 - (x^3 + y^3)$
we know that,
$(a + b)^3 = a^3 + b^3 + 3ab\,(a + b)$
$\therefore P = x^3 + y^3 + 3xy\,(x + y) - x^3 - y^3$
$\Rightarrow P = 3xy\,(x + y)$
$\therefore$ Required factor = $3xy$

8. (A) A.T.Q

$$x = 2 - \sqrt{5}$$

$$\therefore \frac{1}{x} = -2 - \sqrt{5}$$

$$x - \frac{1}{x} = 2 - \sqrt{5} + (2 + \sqrt{5})$$

$$\Rightarrow x - \frac{1}{x} = 4$$

Cubing on both sides, we get,

$$\left(x - \frac{1}{x}\right)^3 = (4)^3$$

$$\Rightarrow x^3 - \frac{1}{x^3} = 64 + 12$$

$$\Rightarrow x^3 - \frac{1}{x^3} = 76$$

9. (A) A.T.Q
Time taken by Mennu in doing whole work = 4 × 3 = 12 hours
Time taken by Komal in doing whole work = 4 × 4 = 16 hours
Time taken by Nisha in doing whole work = 2 × 3 = 6 hours

Meenu–12 — 4
Komal–16 — 3 — 48
Nisha –6 — 8

Work done by them together in 1 hour = 15 units
Time taken by them together doing the double work = $\frac{48\times2}{15} = \frac{96}{15} = 6\frac{2}{5}$ hours

10. (D) A.T.Q

	Rohan	:	Ankit
Time	3 × 2	:	4
Efficiency	2	:	3

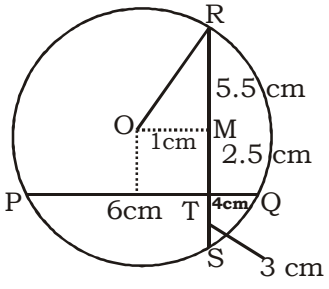
∴ Time taken by Ankit
$= \frac{24(2+3)}{3} = 40$ days

11. (B) A.T.Q

M + D – 23 — 14
M + D + S – 7 — 46 — 322
M – 46 — 7

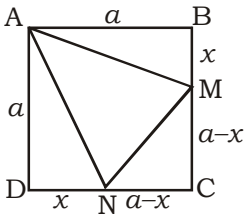
∴ Efficiency of Sachin = 46 – 14 = 32 units
and, efficiency of Devesh = 14 – 7 = 7 units
⇒ Share of Devesh = $\frac{192}{32}\times7$ = ₹42

12. (A)



A.T.Q
We know that
PT × TQ = TS × RT
⇒ 6 × 4 = 3 × RT
⇒ RT = 8 cm
In ΔROM,
$OR^2 = OM^2 + MR^2$
$\Rightarrow OR^2 = (1)^2 + (5.5)^2$
$\Rightarrow OR^2 = 1 + 30.25$
$\Rightarrow OR = \sqrt{31.25}$ cm
∴ Area of circle = πr^2
$= \pi \times \left(\sqrt{31.25}\right)^2$
$= \frac{125}{4}\pi$ cm²

13. (D) A.T.Q



ΔADN ≅ ΔABM
Now,

$$\frac{\text{Area of }\Delta ABM}{\text{Area of }\Delta MNC} = \frac{\frac{1}{2}\times a\times x}{\frac{1}{2}\times(a-x)(a-x)}$$

$$\Rightarrow \frac{\text{Area of }\Delta ABM}{\text{Area of }\Delta MNC} = \frac{a\times x}{(a-x)^2} \quad \ldots\ldots\ldots \text{(i)}$$

ΔAMN is equilateral triangle
∴ AM = MN = y
In ΔABM
$AM^2 = AB^2 + BM^2$
$y^2 = a^2 + x^2$ …… (ii)
In ΔMNC
$MN^2 = NC^2 + MC^2$
$y^2 = (a-x)^2 + (a-x)^2$
$\Rightarrow y^2 = 2(a-x)^2$ …… (iii)
From equation (ii) and (iii), we get
$a^2 + x^2 = 2(a-x)^2$
$\Rightarrow a^2 + x^2 = 2(a-x)^2$
$\Rightarrow 2ax = a^2 + x^2 - 2ax$
$\Rightarrow 2ax = (a-x)^2$

$$\frac{\text{Area of }\Delta ABM}{\text{Area of }\Delta MNC} = \frac{ax}{2ax} = \frac{1}{2}$$

∴ Required ratio = 1 : 2

14. (A) Let the tomatoes produce this year = x^2
and, the tomatoes produce last year = y^2
A.T.Q
$x^2 - y^2 = 143$
$\Rightarrow (x-y)(x+y) = 143$
$\Rightarrow (x+y)(x-y) = 143 \times 1$
$\Rightarrow x + y = 143$
$\underline{x - y = 1}$
$\Rightarrow 2x = 144$
$\Rightarrow x = 72$
and $y = 71$
∴ Tomatoes produce this year
$= (72)^2 = 5184$

15. (B) A.T.Q,

$$\frac{180° - \frac{360°}{4x}}{180° - \frac{360°}{5x}} = \frac{15}{16}$$

$$\Rightarrow \frac{\frac{4x-2}{4x}}{\frac{5x-2}{5x}} = \frac{15}{16}$$

$\Rightarrow 16x - 8 = 15x - 6$

$\Rightarrow x = 2$

$\therefore$ Number of sides = 8 and 10.

16. (C) Let total amount = x

A.T.Q

$$\frac{x \times 68 \times 75}{100 \times 100} = 5049$$

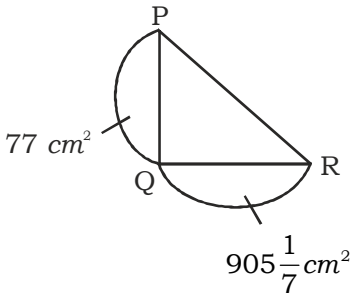
$\Rightarrow x = 9900$

Amount spend on clothes

$$= \frac{9900 \times 68 \times 25}{100 \times 100}$$

= ₹ 1683

17. (D) A.T.Q



Radius of semi-circle on PQ = $\frac{1}{2}$PQ

and Radius semi-circle on QR = $\frac{1}{2}$QR

Area of semi-circle on PQ = $\frac{\pi}{2}\left(\frac{PQ}{2}\right)^2$

$$\Rightarrow 77 = \frac{22}{7 \times 2} \times \frac{PQ^2}{4}$$

$\Rightarrow$ PQ = 14 cm

Area of semi-circle on QR = $\frac{\pi}{2}\left(\frac{QR}{2}\right)^2$

$$\Rightarrow \frac{6336}{7} = \frac{22}{7 \times 2} \times \frac{QR^2}{4}$$

QR = 48 cm

Now, ΔPQR is right angled triangle

$\therefore PQ^2 + QR^2 = PR^2$

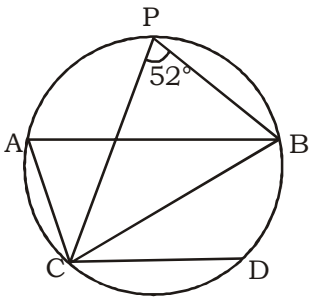
$\Rightarrow PR^2 = (14)^2 + (48)^2$

$\Rightarrow PR^2 = 256 + 2304$

$\Rightarrow PR^2 = 2560$

$\therefore$ Required area = $\frac{\pi}{2} \times \frac{2560}{4} = 320\,\pi\ cm^2$

18. (C) A.T.Q



$\because$ AB is the diameter of circle

So, $\angle ACB = 90°$ (angle made in semi-circle)

and AB $\parallel$ CD

$\therefore \angle ACD + \angle BAC = 180°$

and $\angle BAC = \angle BPC = 52°$

$\therefore \angle BCD = 180° - 90° - 52° = 38°$

19. (B) A.T.Q

Slope of the straight line

$m = \tan 120°$

$$\Rightarrow m = -\frac{1}{\sqrt{3}}$$

The equation of straight line passing through (x, y) and slope m is

$y - y_1 = m(x - x_1)$

$$\Rightarrow y + 2 = -\frac{1}{\sqrt{3}}(x - 0)$$

$\therefore$ Required equation = $\sqrt{3}\,y + 2\sqrt{3} + x = 0$

20. (C) A.T.Q

We know that,

$$d = \frac{|Am + Bn + C|}{\sqrt{A^2 + B^2}}$$

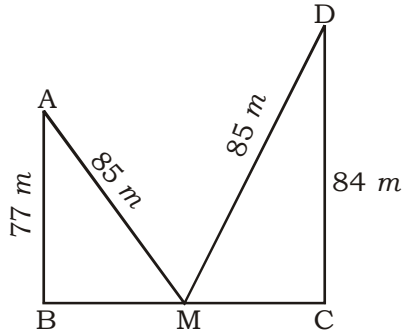
$\therefore$ Lengh of perpendicular

$$= \frac{|15 \times 4 + 8 \times 3 + 18|}{\sqrt{15^2 + 8^2}}$$

$$= \frac{60 + 24 + 18}{\sqrt{225 + 64}}$$

$$= \frac{102}{17} = 6 \text{ units}$$

21. (A) A.T.Q



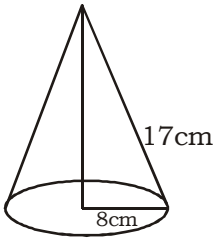
In ΔABM,
$BM^2 = AM^2 - AB^2$
$BM^2 = (85)^2 - (77)^2$
$\Rightarrow BM^2 = 7225 - 5929$
$\Rightarrow BM^2 = 1296$
$\Rightarrow BM = 36m$
In ΔDMC,
$MC^2 = DM^2 - DC^2$
$\Rightarrow MC^2 = 7225 - 7056$
$\Rightarrow MC = 13$ m
$\therefore$ Width of the street = 36 + 13 = 39 m

22. (B) Let the initial length of reactangle = x m
and, the initial breath of reactangle = y m
A.T.Q
$2 \times 4x + 2 \times y = 480$
$\Rightarrow 4x + y = 240$ ..... (i)
and, $4x \times y = 12800$
$\Rightarrow xy = 3200$ ..... (ii)
Putting the value of $x = 40$ in equation, (i) and (ii), we get,
$4(40) + y = 240$
$\Rightarrow y = 80$
and, $40 \times y = 3200$
$\Rightarrow y = 80$
Hence, the initial length of reactangle = 40 meter

23. (B) Let length and breath are x and y respectively.
A.T.Q
$xy = 240$ ..... (i)
and $2(x + y) = 52$
$\Rightarrow x + y = 26$ ..... (ii)
Squaring both sides of equation (ii), we get,
$(x + y)^2 = (26)^2$
$\Rightarrow x^2 + y^2 + 2xy = 676$
$\Rightarrow x^2 + y^2 + 2(240) = 676$
$\Rightarrow x^2 + y^2 = 676 - 480$
$\Rightarrow x^2 + y^2 = 676 - 480$
$\Rightarrow x^2 + y^2 = 196$
$\Rightarrow \sqrt{x^2 + y^2} = 14m$
Hence, length of diagonal = 14 meter

24. (C) A.T.Q
Largest number = 420
Smallest number = 204
Average $= \frac{420 + 204}{2} = 312$

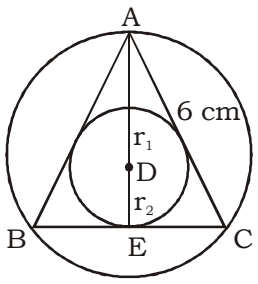
25. (A) A.T.Q,
Height of the cone
$= \sqrt{l^2 - r^2}$
$= \sqrt{(17)^2 - (8)^2}$
$= \sqrt{289 - 64} = \sqrt{225}$
$h = 15$ cm



Now,
Volume of the cone = Volume of sphere
$\frac{1}{3}\pi r^2 h = \frac{4}{3}\pi R^3$
$\Rightarrow 16 \times 15 = R^3$
$\Rightarrow R = 2\sqrt[3]{30}$ cm
$\therefore$ Radius of the sphere = $2\sqrt[3]{30}$ cm

26. (B) A.T.Q
Distance travel by first man in 1 hour = 6 km
$\therefore$ Time taken by second man to meet first man $= \frac{6}{8-6} = 3$ hours
Total distance travel by first man in (3 + 1) hours = $4 \times 6 = 24$ km
At 2 p.m first man will be 24 km away from the starting point.
and, At 2 pm third man will be 12 km away from the starting point.
$\therefore$ Distance between first man and third man = 24 – 12 = 12 km
$\therefore$ They meet after $= \frac{12}{12+6} = \frac{12}{18}$
= 40 minutes
Required time = 2:40 pm
So, first man meets to third man at 2:40p.m.

27. (C)



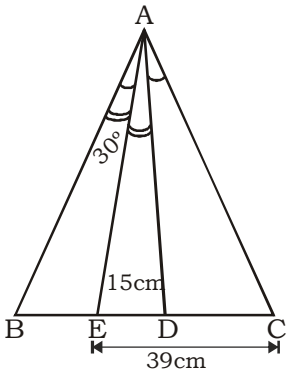
Circum-radius of ΔABC (AD) $= \frac{6}{\sqrt{3}}$ cm
$= 2\sqrt{3}$ cm
and, In radius of ΔABC (DE) $= \frac{6}{2\sqrt{3}} = \sqrt{3}$ cm
Hence, required difference
$= \pi (r_1)^2 - \pi (r_2)^2$
$= \pi\left[\left(2\sqrt{3}\right)^2 - \left(\sqrt{3}\right)^2\right]$
$= \pi [12 - 3]$
$= 9\pi$ cm^2

28. (C) A.T.Q
$\frac{1}{3} \times \pi \times r_1^2 \times 3h = \frac{1}{3} \times \pi \times r_2^2 \times 2h$
$\Rightarrow \frac{r_1}{r_2} = \frac{\sqrt{2}}{\sqrt{3}}$

$\Rightarrow r_2 = \frac{\sqrt{3}}{\sqrt{2}} r_1$

Required difference = $\sqrt{\frac{3}{2}}$ times

29. (B)



A.T.Q,

$\angle BAE = \angle DAE = 30°$

($\because$ AE is the angle bisctor of BAD)

and, $\angle BAD = \angle BAE + \angle DAE$

$= 30° + 30° = 60°$

$\angle DAC = \angle BAD = 60°$

$\angle EAC = \angle EAD + \angle DAC$

$\Rightarrow \angle EAC = 30° + 60° = 90°$

So, It $\angle EAC$ is right angle triangle

$\therefore AC^2 = EC^2 - AE^2$

$\Rightarrow AC^2 = (39)^2 - (15)^2$

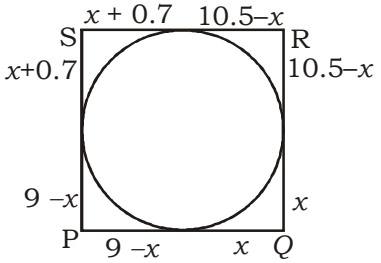
$\Rightarrow AC^2 = 1521 - 225$

$\Rightarrow AC^2 = 1296$

$\Rightarrow AC = 36$ cm

$\therefore$ Area of $\Delta AEC = \frac{1}{2} \times 15 \times 36 = 270\ cm^2$

30. (C) A.T.Q,



$\therefore$ Length of SP = $9 - x + 0.7 + x = 9.7$ cm

31. (C) A.T.Q,

$1 \times 2 + 2 \times 3 + 3 \times 4$ ..... $+ 16 \times 17$

we know that,

$1 \times 2 + 2 \times 3 + 3 \times 4$ ..... $+ x(x+1)$

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

$1 \times 2 + 2 \times 3 \times 3 \times 4$ ..... $+16(17)$

$= \frac{16 \times 17 \times 18}{3}$

Hence, required sum = 1632

32. (B) A,.T.Q

Total sum of page numbers = $\frac{40(41)}{2} = 820$

Sum of the page numbers sheet

$= 820 - 795 = 25$

$\therefore$ Required numbers = 12 and 13

33. (A) A.T.Q

$\cot\theta + \cos\theta = p$

$\cot\theta - \cos\theta = q$

Now

$p^2 - q^2 = \cot^2\theta + \cos^2\theta + 2\cot\theta\cos\theta - \cot^2\theta - \cos^2\theta + 2\cos\theta\cot\theta$

$\Rightarrow p^2 - q^2 = 4\left(\frac{\cos^2\theta}{\sin\theta}\right)$

$= 4\left(\frac{1-\sin^2\theta}{\sin\theta}\right)$

$= 4(\text{cosec}\,\theta - \sin\theta)$

34. (C) A.T.Q

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

$\Rightarrow \frac{2\cos\theta(1+\cos\theta-\sin\theta)}{(1+\cos\theta+\sin\theta)(1+\cos\theta-\sin\theta)} = x$

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

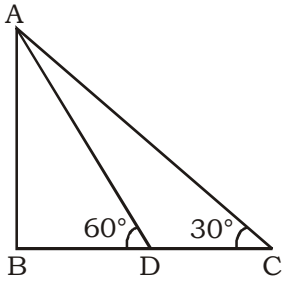
$\Rightarrow \frac{2\cos\theta(1+\cos\theta-\sin\theta)}{(1+\cos^2\theta+2\cos\theta-\sin^2\theta)} = x$

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

$\Rightarrow \frac{2\cos\theta(1+\cos\theta-\sin\theta)}{2\cos\theta(\cos\theta+1)} = x$

$\Rightarrow \frac{1-\sin\theta+\cos\theta}{1+\cos\theta} = x$

35. (C) A.T.Q



In ΔABC,

$\frac{AB}{BC} = \tan 30°$

$\Rightarrow \frac{AB}{BC} = \frac{1}{\sqrt{3}}$

$\Rightarrow BC = \sqrt{3}\,AB$ ..... (i)

Now, In ΔABD

$\frac{AB}{BD} = \tan 60°$

$\Rightarrow \frac{AB}{BD} = \sqrt{3}$

$\Rightarrow BD = \frac{AB}{\sqrt{3}}$ ..... (ii)

and, $DC = BC - BD$

$\Rightarrow DC = \sqrt{3}\,AB - \frac{AB}{\sqrt{3}}$

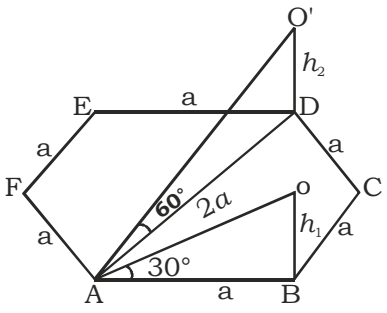
$\Rightarrow DC = \frac{3AB - AB}{\sqrt{3}} = \frac{2AB}{\sqrt{3}}$

Time taken by the car to travel distance of $\frac{2AB}{\sqrt{3}}$ = 40 minutes

$\therefore$ Time taken by the car to travel distance of $\frac{AB}{\sqrt{3}} = \frac{40}{2AB} \times \frac{\sqrt{3} \times AB}{\sqrt{3}}$ = 20 minutes

Hence, required time = 20 + 40 = 60 minutes

36. (C) A.T.Q,



Let the length of sides of regular Hexagon = a cm

$\therefore$ Diagonal (AD) of Hexagon = 2a cm

In ΔABO

$\frac{h_1}{a} = \tan 30°$

$\Rightarrow \frac{h_1}{a} = \frac{1}{\sqrt{3}}$

$\Rightarrow h_1 = \frac{a}{\sqrt{3}}$ cm

Now, In $\Delta ADO'$

$\frac{h_2}{AD} = \tan 60°$

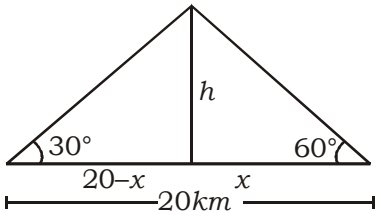
$\Rightarrow \frac{h_2}{2a} = \sqrt{3}$

$\Rightarrow h_2 = 2\sqrt{3}a$ cm

$\therefore$ Required ratio = $h_1 : h_2$

$= \frac{a}{\sqrt{3}} : 2\sqrt{3}\,a = 1 : 6$

37. (B) A.T.Q



$\frac{h}{20 - x} = \frac{1}{\sqrt{3}}$

$\Rightarrow \sqrt{3}\,h = 20 - x$

$\Rightarrow x = 20 - \sqrt{3}\,h$ ..... (i)

and,

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

$\Rightarrow x = \frac{h}{\sqrt{3}}$ ..... (ii)

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

$20 - \sqrt{3}\,h = \frac{h}{\sqrt{3}}$

$\Rightarrow 20\sqrt{3} - 3h = h$

$\Rightarrow h = 5\sqrt{3}$

$\therefore$ Height of kite = $5\sqrt{3}$ km

38. (A) A.T.Q

$\frac{\sqrt{3}}{\sqrt{19 + 8\sqrt{3}} - \sqrt{19 - 8\sqrt{3}}}$

$= \frac{\sqrt{3}}{\sqrt{16 + 3 + 2 \times 4 \times \sqrt{3}} - \sqrt{16 + 3 - 2 \times 4\sqrt{3}}}$

$= \frac{\sqrt{3}}{\left(4 + \sqrt{3}\right) - \left(4 - \sqrt{3}\right)}$

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

39. (D) A.T.Q
$\cos x = \sin 60° \cos 30° - \sin^2 30°$

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

$\Rightarrow \cos x = \frac{3}{4} - \frac{1}{4}$

$\Rightarrow \cos x = \frac{2}{4} = \frac{1}{2}$

$\Rightarrow x = 60°$

40. (B) A.T.Q

$$\frac{1}{\text{cosec}^2\theta} + \frac{\sin^2\theta\left(2\cos^4 - \cos^2\theta\right)}{\sin^2\theta - 2\sin^4\theta}$$

$$= \sin^2\theta + \frac{\sin^2\theta\cos^2\theta\left(2\cos^2\theta - 1\right)}{\sin^2\theta\left(1 - 2\sin^2\theta\right)}$$

$\Rightarrow \sin^2\theta + \cos^2\theta = 1$

41. (B) A.T.Q
$a + b + c = 5$ ..... (i)
$a^2 + b^2 + c^2 = 29$..... (ii)
and, $a^3 + b^3 + c^3 = 83$ ..... (iii)
Putting the values of a, b and c are 4, 3 and – 2
$a + b + c = 4 + 3 - 2 = 5$
$a^2 + b^2 + c^2 = 16 + 9 + 4 = 29$
and, $a^3 + b^3 + c^3 = 264 + 27 - 8 = 83$
All three equations are satisfied
$\therefore$ Value of abc = $4 \times 3 \times (-2) = -24$

42. (C) A.T.Q

$$\frac{1}{a} = \frac{x+y}{xy}, \frac{1}{b} = \frac{x+z}{xz} \text{ and } \frac{1}{c} = \frac{y+z}{yz}$$

Now, $\frac{1}{a} + \frac{1}{b} - \frac{1}{c} = \frac{x+y}{xy} + \frac{x+z}{xz} - \frac{y+z}{yz}$

$$\Rightarrow \frac{bc+ac-ab}{abc} = \frac{zx+zy+xy+yz-xy-xz}{xyz}$$

$$\Rightarrow \frac{bc+ac-ab}{abc} = \frac{2yz}{xyz}$$

$$\Rightarrow x = \frac{2(abc)}{bc+ac-ab}$$

43. (A) A.T.Q
$x(x-4) = -2$ .....(i)

$\Rightarrow x - 4 = \frac{-2}{x}$ .....(ii)

Cubing on both sides of equation, we get
$x^3 (x-4)^3 = (-2)^3$
$\Rightarrow x^3 [x^3 - 64 - 12x(x-4)] = -8$
$\Rightarrow x^3 [x^3 - 64 - 12x \times (-2/x)] = -8$
$\Rightarrow x^3 (x^3 - 40) = -8$

44. (D) $(x^n + 1)$ is divisible by $(x + 1)$, when n is odd
$\Rightarrow$ $(67^{67} + 1)$ is divisible by $(67 + 1)$
$\Rightarrow [(67^{67} + 1) + 66] \div 68$
Gives remainder 66.
$\therefore$ When $(67^{67} + 67)$ is divided by 68, then remainder is 66.

45. (B) We know that,
$a^3 + b^3 + c^3 - 3abc$
$= (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$

$= \frac{1}{2}(a + b + c)(2a^2 + 2b^2 + 2c^2 - 2ab - 2bc - 2ca]$

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

now,

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

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

$\Rightarrow \frac{35 + 20 - 15}{2} = 20$

46. (B) A.T.Q
$2^{64} - (2 + 1)(2^2 + 1)(2^4 + 1)(2^8 + 1)(2^{16} + 1)(2^{32} + 1)$
$= 2^{64} - (2 - 1)(2 + 1)(2^2 + 1)(2^4 + 1)(2^8 + 1)(2^{16} + 1)(2^{32} + 1)$
$= 2^{64} - (2^{64} - 1)$
$= 2^{64} - 2^{64} + 1 = 1$

47. (A) A.T.Q

$$2p = \sqrt{x} + \frac{1}{\sqrt{x}}$$

Squaring both sides, we get

$$4p^2 - 4 = x + \frac{1}{x} + 2 - 4$$

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

$$\sqrt{p^2 - 1} = \frac{1}{2}\left(\sqrt{x} - \frac{1}{\sqrt{x}}\right)$$

Now,

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

$$= \frac{x-1}{2}$$

48. (C) A.T.Q

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

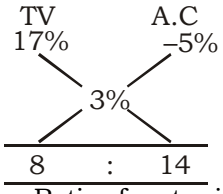
Adding 3 on both sides, we get,

$$\frac{a^2+bc}{a^2-bc}+1+\frac{b^2+ca}{b^2-ca}+1+\frac{c^2+ab}{c^2-ab}+1$$
$$= 1 + 3$$
$$\Rightarrow \frac{2a^2}{a^2-bc}+\frac{2b^2}{b^2-ca}+\frac{2c^2}{c^2-ab}=4$$
$$\Rightarrow \frac{a^2}{a^2-bc}+\frac{b^2}{b^2-ca}+\frac{c^2}{c^2-ab}=2$$

49. (C) Let the principle = 1000 unit
A.T.Q
$$25\% = \frac{25}{100} = \frac{1}{4}$$
Principle $\rightarrow$ 1000
Ist year $\rightarrow$ 250
2nd year $\rightarrow$ 250 + 62.5
3rd year $\rightarrow$ 250 + 62.5 + 62.5 + 15.625
Difference between C.I. and SI
= 203.125 units
When P = 1000, then difference
= 203.125
$$\therefore \text{ Required difference } = \frac{1000}{203.125}\times 182$$
= ₹896

50. (A) A.T.Q
Sachin's income after end of third year
$$= \frac{36000\times 90\times 95\times 115}{100\times 100\times 100} = ₹35397$$

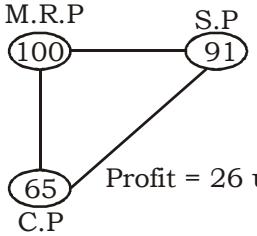
51. (C) A.T.Q



$\therefore$ Ratio of cost price of T.V. and A.C = 4 : 7
So, cost price of A.C.
$$= \frac{22000}{11}\times 7 = ₹14000$$

52. (B) Let income of Sachin = ₹x
A.T.Q
$$\frac{(100-80)}{80}\times 100 = 16368$$
$$\Rightarrow x = \frac{16368\times 100\times 100}{93\times 88}$$
$$\Rightarrow x = 20000$$

53. (A) A.T.Q



Hence, profit% $= \frac{26}{65}\times 100 = 40\%$

54. (A) Let two numbers are x and y
A.T.Q
$x - y = 3z$ ..... (i)
$x + y = 11z$ ..... (ii)
and, $xy = 56z$ ..... (iii)
By solving equation (i) and (ii)
$x = 7z$ and $y = 4z$
From equation (iii)
$7z \times 4z = 28z^2$
$z = 2$
$x - y = 6$
$\therefore$ Required difference = 6

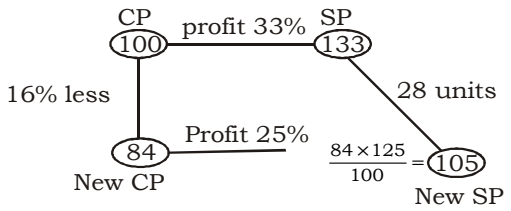
55. (A) A.T.Q
Ratio of their savings = 4 : 1
$\therefore$ Savings of Ram and Syam
$$= \frac{5000}{5}\times 4 \text{ and } \frac{5000}{5}\times 1$$
= ₹4000 and ₹1000
Now,
$2x - 5y = 4000$ ..... (i)
$x - 3y = 1000$ ..... (ii)
Solving equation (i) and (ii), we get
$x = 7000$
Hence, monthly income of Mohan
= ₹7000

56. (A) From option (A)
$$23 + 13 - \frac{299}{100} = 36 - 2.99 = 33.01\%$$

57. (B) Let total number of article = ₹ x
A.T.Q.,
$$\frac{36}{12}\times x + \frac{24}{12}\times x - \frac{27}{12}\times 2x = 90$$
$$\Rightarrow \frac{60x-54x}{12} = 90$$
$\Rightarrow 6x = 90 \times 12$
$\Rightarrow 2x = 360$
$\therefore$ Total number of articles = 360

58. (C) Let the numbers
$= n, n+1, n+2, n+3$ ..... $n+6$
A.T.Q
$$= \frac{n+n+1+n+2+n+3+n+4+n+5+n+6}{7} = m$$
$$\Rightarrow \frac{7n+21}{7} = m$$
$\Rightarrow m = n + 3$
$\therefore$ Required average
$$= \frac{m+m+1+m+2+m+3.....m+7}{8}$$
$$= \frac{8m+28}{8} = \frac{2m+7}{2}$$

59. (B) A.T.Q

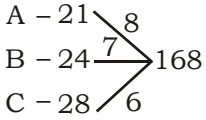


28 units = ₹56

$\therefore$ Selling price = $\frac{133 \times 56}{28}$ = ₹266

60. (B) Let profit = x
CP = 100
A.T.Q
$2(100 + x) = 100 + 3x$
$\Rightarrow$ $x = 100$
Profit = 100%

61. (B) A.T.Q



$\therefore$ Work done by (A + B + C) in 6 days
= (8 + 15 + 14 + 15 + 8 + 21)
$\therefore$ Work done in 12 days = 81 × 2 = 162
Now, remaining work = 168 – 162 = 6
Hence, work must be done = $12 + \frac{6}{8}$ = $12\frac{3}{4}$ days

62. (D) Let the number of days = x
A.T.Q

$$\frac{672}{x} - \frac{672}{(x+4)} = 4$$

$$\Rightarrow \frac{672x + 4 \times 672 - 672x}{x^2 + 4x} = 4$$

$\Rightarrow x^2 + 4x - 672 = 0$
$\Rightarrow x^2 + 28x - 24x - 672 = 0$
$\Rightarrow x(x + 28) - 24(x + 28) = 0$
$\Rightarrow x = -28$ and $x = 24$
Required number of days = 24 days

63. (A) Let pipe A alone can fill the tank = x hr and pipe B alone can empty the tank = y hr
A.T.Q

$$2\left(\frac{1}{x} - \frac{1}{y}\right) = \left(\frac{1}{x} + \frac{1}{y}\right)$$

$\Rightarrow 2(y - x) = x + y$
$\Rightarrow y = 3x$

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

$\therefore$ Required ratio = 3 : 1

64. (C) Let

SP	Item
100	100
80	150

When there is no profit means
CP = SP
$\therefore$ CP = 80
Hence, profit = $\frac{(100 - 80)}{80} \times 100$ = 25%

65. (A) A.T.Q
Total sum of three numbers
= 1200 × 3 = 3600
$\therefore$ $2x + 3x + 4x = 3600$
$\Rightarrow$ $x = 400$
$\therefore$ First number = 400 × 2 = 800
Second number = 400 × 3 = 1200
Third number = 400 × 4 = 1600
Now,

$$\frac{800 \times 110}{100} + \frac{1200 \times 80}{100} + \frac{1600 \times (100 + x)}{100}$$

$$= \frac{3600 \times 104}{100}$$

$\Rightarrow 880 + 960 + 16 \times (100 + x) = 3744$

$$\Rightarrow 100 + x = \frac{1904}{16}$$

$\Rightarrow 100 + x = 119$
$\Rightarrow x = 19$
$\therefore$ Required increment = 19%

66. (A) A.T.Q
Total surfare area of copper cube = Total surface area of zinc coubid
$\Rightarrow 6a^2 = 2[2l^2 + 8l^2 + 4l^2]$
$\Rightarrow 6a^2 = 28l^2$

$$\Rightarrow \frac{a^2}{l^2} = \frac{14}{3}$$

$$\Rightarrow \frac{a}{l} = \left(\frac{14}{3}\right)^{1/2}$$

$$\frac{a^3}{l^3} = \left(\frac{14}{3}\right)^{3/2}$$

$\therefore$ Volume ratio of cube and cuboid
$= a^3 : lbh$

$$= \left(\frac{14}{3}\right)^{3/2} : 8$$

67. (B) Let the total number = 100
A.T.Q

Markes obtain by Arjun = $\frac{40 \times 90}{100}$ = 36

Markes obtain by Bheem = $\frac{36 \times 800}{900}$ = 32

Markes obtain by Karan = $\frac{68 \times 1000}{1700}$ = 40

$\therefore$ Required percentage = 0

68. (C) Let total profit = x
A.T.Q
Ratio of their investment = 3 : 4 : 5

$$\frac{x\times12}{100}+\frac{x\times73}{100}\times\frac{4}{12}=2180$$

$\Rightarrow x = 6000$

Profit of C = $\frac{6000\times73}{100}\times\frac{5}{12}$ = ₹1825

69. (B) A.T.Q

X	Y	Z
1500	1350	1296
	1875	1800

In race of 1500 m X beat Z = 204 m
$\therefore$ Required difference

$$=\frac{204}{1500}\times2000=272m$$

70. (B) Let the speed of the trains be $3x$ m/s and $4x$ m/s
Then, length of each train

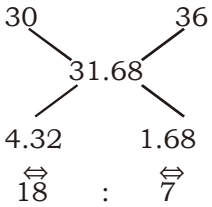
$$=\frac{(3x+4x)\times20}{2}=70x$$

Now,
Distance travelled by faster train in 35 seconds = $35\times4x = 140x$
and,
$70x + 700 = 140x$
$\Rightarrow 70x = 700$
Length of each train = $700m$

71. (A) A.T.Q

Net price of 100 kg tea = $\frac{32\times99}{100}$

= ₹31.68 per kg
Now, using Alligation



$\therefore$ Required ratio = 18 : 7

72. (B) A.T.Q
Total weight of 7 different experiments
= 7 × 53.735 = 376.145 *kg*
Weight of first three experiments
= 54.005 × 3 = 162.015 kg
and, the weight of sixth and seventh experiment
= (54.005 – 0.010) × 2 = 107.990 kg
Now, the weight of fourth and fifth experiment
= 376.145 – 162.015 – 107.990
= 106.14 kg
and the difference of their weight
= 0.004 kg
Weight of fourth experiment

$$=\frac{106.14+0.004}{2}=53.072\text{ kg}$$

73. (C) A.T.Q
The efficiency of A, B and C be 1, 2 and 2 respectively.
Then, total work = 1 × 18 = 18 units
Now, workdone by A and B in 3 days
= 3 × 3 = 9 units
Remaining work = 18 – 9 = 9 units
Then, time taken by A and C to complete remaining work = $\frac{9}{3}$ = 3 days

74. (C) A.T.Q

$$\frac{(N+J)\times12}{1}=\frac{3.5N+7.5J}{\frac{1}{3}}$$

$\Rightarrow$ 4N + 4J = 3.5 N + 7.5 J
$\Rightarrow$ 0.5 N = 3.5 J
$\Rightarrow$ N = 7J
$\Rightarrow \frac{N}{J}=\frac{7}{1}$ → Efficiency of Neetu / Efficiency of Jyoti
Now, total work = (N + J) × 12
= (1 + 7) × 12 = 96 units
Time taken by Jyoti to complete the work = $\frac{96}{1}$ = 96 hours

75. (A) A → 32, B → 48, C → 56 ; 672 ; 21, 14, 12
Work done by A in 4 days = 21 × 4 = 84 units
and, work could be done by C in 12 days
= 12 × 12 = 144 units
Now, time taken to complete the work

$$=\frac{672-84+144}{14+12}=\frac{366}{13}=28\frac{2}{13}\text{ days}$$

76. (B) A.T.Q
(4M + 3B)×5 = (2W + 3B)×5 = (4M + 3W)×5
On comparing, we get,
Ratio of efficiency of man, woman and boys = 1 : 2 : 2
Now, total work = (4M + 3B) × 5
= (4 × 1 + 3 × 2) × 5 = 50 units
Then, time taken by one man, one woman and one boy to complete the work with double efficiency

$$=\frac{50}{(1+2+2)\times2}=\frac{50}{10}=5\text{ days}$$

77. (B) Let the price of the third variety of tea per kg be ₹x
A.T.Q
$136 \times 1 + 147 \times 1 + x \times 3 = 161 \times 5$
$\Rightarrow 136 + 147 + 3x = 805$
On solving, we get $x = 174$
$\therefore$ Price of the tea = ₹174 per kg

78. (C) A.T.Q
CP of coffee powder for 10 cups of coffee = ₹20
CP of milk for 10 cups of coffee = 2×30 = ₹60
Total CP = ₹80

Now, SP = $80 \times \frac{125}{100}$ = ₹100

Then, SP of each cup of coffee

= $\frac{100}{10}$ = ₹10 per kg

79. (B) A.T.Q

year	2005	2006	2007
Sale	100	30	100

Required percentage incerment in sale

= $\frac{100-30}{30} \times 100 = \frac{70}{30} \times 100 = 233.3\%$

80. (A) A.T.Q

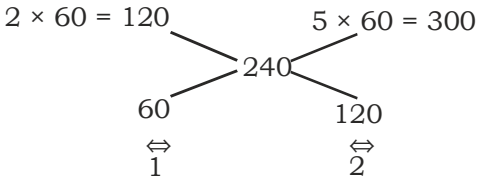
$$\frac{x \times Q \times t}{100} + x = \frac{y \times P \times t}{100} + y$$

$$\Rightarrow \frac{(Qx - Py) \times t}{100} = y - x$$

$$\Rightarrow t = \frac{(y-x) \times 100}{Qx - Py}$$

$$\Rightarrow t = \frac{100(x-y)}{Py - Qx}$$

81. (C) Using Alligation method, we get



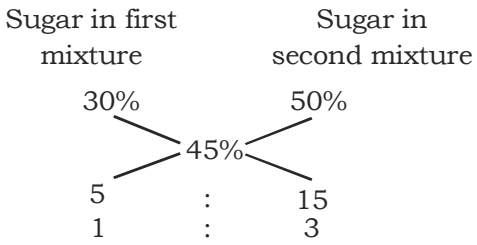
(1 + 2) = 3 units = 60 coins
Then, number of ₹5 coins = 2 units

= $\frac{60}{3} \times 2$ = 40 coins

82. (D) A.T.Q
Total profit = $3 \times 30 = 90$
and, total loss = $2 \times 20 = 40$
Then, net profit = $90 - 40 = 50$

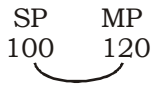
Now, gain percent = $\frac{50}{3+2}$ = 10%

83. (C) A.T.Q



$\therefore$ Required ratio = 1 : 3

84. (B) A.T.Q



Discount = $\frac{20}{120} \times 100 = \frac{50}{3}\%$

$\therefore$ CP = $\frac{100 \times 100 \times 3}{350} = \frac{600}{7}$

$\therefore$ Required ratio = $\frac{50}{3} : \frac{600}{7}$ = 7:36

85. (D) A.T.Q

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

Squaring both sides, we get

$$x^2 = 3 + \frac{1}{3} + 2$$

$$\Rightarrow x^2 = \frac{16}{3}$$

$$\Rightarrow x^4 = \frac{256}{9}$$

and, $y = \sqrt{3} - \frac{1}{\sqrt{3}}$

$$\Rightarrow y^2 = \frac{4}{3}$$

$$\Rightarrow y^4 = \frac{16}{9}$$

Now, $x^4 + y^4 = \frac{256}{9} + \frac{16}{9} = \frac{272}{9}$

86. (A) Let speed of boat = x km/hr
Speed of stream = y km/hr
A.T.Q

$$\frac{12}{x-y} + \frac{18}{x+y} = 3 \text{ ..... (i)}$$

$$\frac{36}{x-y} + \frac{24}{x+y} = \frac{13}{2} \text{ ..... (ii)}$$

Solving equation (i) and (ii), we get
$\therefore$ Speed of boat = 2 km/hr

87. (B) Required area = $\frac{4}{20} \times (60 + 20) = 16$ acres

88. (A) Required ratio = 72 : 90

89. (C) A.T.Q

10% of $72° = \frac{72 \times 10}{100} = 7.2$

Required angle = $50° + 7.2° \times \frac{2}{3}$

$= 50° + 4.8° = 54.8°$

90. (B) Let the production of barley = x

A.T.Q,

Production of maize = $3x$

Production of wheat = $12x$

Required ratio = $\frac{12x}{50} : \frac{x}{48} = 288 : 25$

91. (C) A.T.Q

wheat, rice and maize

$= \left(\frac{50}{360} \times 100 + \frac{72}{360} \times 100 + \frac{60}{360} \times 100\right)$

$= 51\%$ (approximate)

92. (D) Let speed of A = x meter/min.

speed of B = y meter/min.

Let they meet after = t minutes

A.T.Q

Distance traveled by A after meeting = $72x$

Distance traveled by B after meeting = $18y$

Distance traveled by A after crossing

= distance traveled by B before crossing

$yt = 72x$ ..... (i)

$xt = 18y$ ..... (ii)

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

$xyt^2 = 72 \times 18 \times xy$

$t = 36$

$\therefore$ Required time = 18 + 36 = 54 minutes

93. (B) A.T.Q

Total length = 160 + 140 = 300 m

Relative speed = (77 + 67) km/hr

$= 144 \times \frac{5}{18} = 40$m/sec

$\therefore$ Required time $= \frac{300}{40} = 7\frac{1}{2}$ seconds

94. (D) A.T.Q

SI for one year = $\frac{880}{2} = 440$

$\therefore$ Required rate = $\frac{11}{440} \times 100 = 2.5\%$

95. (A) A.T.Q

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

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

$\Rightarrow 2x = 4y$

$\Rightarrow x = 2y$

$\therefore$ Speed of current = $\frac{26}{3 \times 2} = 4\frac{1}{3}$ km/hr

96. (C) Required percentage increase

$= \frac{120 - 100}{100} \times 100 = 20\%$

97. (B) A.T.Q

Average production at given years

$= \frac{100 + 120 + 110 + 140 + 75 + 130}{6}$

$= \frac{675}{6} = 112.5$

Hence, required years = 2013, 2015 and 2017

98. (D) A.T.Q

Sum of production during odd years

= 120 + 140 + 130 = 390

Sum of production during even years

= 100 + 110 + 75 = 285

$\therefore$ Required difference = $\frac{390}{285} = 1.37$ times

99. (C) Total production in 2013 and 2015

= 120 + 140 = 260

Production in 2017 = 130

100. (B) Average production during given years

$= \frac{100 + 120 + 110 + 140 + 75 + 130}{6}$

= 112.5

$\therefore$ Required production = 113000 tonnes

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