

## ANSWER SET - 001

01. (3) 02. (3) 03. (3) 04. (3) 05. (3)  
 06. (4) 07. (2) 08. (3) 09. (4) 10. (3)  
 11. (1) 12. (2) 13. (2) 14. (2) 15. (4)  
 16. (2) 17. (4) 18. (4) 19. (3) 20. (3)  
 21. (3) 22. (2) 23. (1) 24. (3) 25. (1)  
 26. (3) 27. (3) 28. (4) 29. (3) 30. (2)  
 31. (4) 32. (3) 33. (3) 34. (3) 35. (4)  
 36. (3) 37. (3) 38. (3) 39. (1) 40. (1)  
 41. (1) 42. (4) 43. (2) 44. (3) 45. (2)  
 46. (3) 47. (1) 48. (3) 49. (3) 50. (1)  
 51. (2) 52. (2) 53. (2) 54. (3) 55. (1)  
 56. (3) 57. (2) 58. (4) 59. (3) 60. (1)  
 61. (1) 62. (3) 63. (3) 64. (4) 65. (1)  
 66. (3) 67. (3) 68. (3) 69. (3) 70. (3)  
 71. (3) 72. (2) 73. (1) 74. (2) 75. (3)  
 76. (4) 77. (1) 78. (2) 79. (2) 80. (4)  
 81. (1) 82. (2) 83. (4) 84. (2) 85. (1)  
 86. (3) 87. (1) 88. (2) 89. (3) 90. (2)  
 91. (1) 92. (2) 93. (4) 94. (3) 95. (3)  
 96. (3) 97. (3) 98. (3) 99. (3) 100. (2)

## EXPLANATION - 001

01. Mouth is related to articulation.  
 In the same way music is related to tune.  
 02. If Gravity is related to pull. In the same way Magnetism is related to Attraction.  
 03.  $8^3 = 512 \rightarrow$  Reverse of 512 is 215  
 $6^3 = 216 \rightarrow$  Reverse of 216 is 612  
 04. Steering wheel, engine and tyre are the parts of a car.

05. (1)  $\begin{matrix} & +1 & \\ \swarrow & & \searrow \\ U & R & T \\ \downarrow & & \downarrow \\ & +2 \uparrow & \end{matrix}$   
 (2)  $\begin{matrix} & +1 & \\ \swarrow & & \searrow \\ G & D & F \\ \downarrow & & \downarrow \\ & +2 \uparrow & \end{matrix}$   
 (3)  $\begin{matrix} & +2 & \\ \swarrow & & \searrow \\ P & L & N \\ \downarrow & & \downarrow \\ & +2 \uparrow & \end{matrix}$   
 (4)  $\begin{matrix} & +1 & \\ \swarrow & & \searrow \\ N & K & M \\ \downarrow & & \downarrow \\ & +2 \uparrow & \end{matrix}$

06.  $\begin{matrix} 6 & 13 & 18 & 25 & 30 & 37 & 40 \rightarrow 42 \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ +7 \uparrow & +5 \uparrow & +7 \uparrow & +5 \uparrow & +7 \uparrow & +5 \uparrow & \end{matrix}$   
 07.  $\frac{28}{7} + 4 = 8, \frac{35}{5} + 3 = 10, \frac{32}{8} + 5 = 9$

08.  $\begin{matrix} & \text{husband} & \\ \swarrow & & \searrow \\ \text{Rajesh} & & \text{Laxmi} \\ \swarrow & & \searrow \\ \text{Raghu} & & \text{Rajan} \\ \swarrow & & \searrow \\ \text{Babu} & & \text{Rima} \\ \swarrow & & \searrow \\ & \text{twins} & \\ & \text{sister} & \\ & \text{husband} & \end{matrix}$

09.  $K > B$  and  $Y > B > J$ . It means J is on bottom.  
 10. Dog is called as Elephant.  
 11.  $16 + 4 \div 2 \times 3 = 22 = 16 + 2 \times 3 = 16 + 6 = 22$   
 12. VIEW

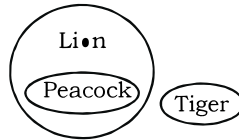
13.  $\begin{matrix} D & R & E & A & M & \text{and} & T & R & Y \\ \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & & \downarrow & \downarrow & \downarrow \\ 23 & 9 & 22 & 26 & 14 & & 7 & 9 & 2 \end{matrix}$   
 (Alphabetic position from last to first)

Similarly,

$\begin{matrix} S & K & Y \\ \downarrow & \downarrow & \downarrow \\ 8 & 16 & 2 \end{matrix}$

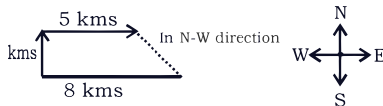
14. Set of three letters are horizontally reversed.

15.



- I.  $\times$   
 II.  $\times$   
 III.  $\times$   
 IV.  $\checkmark$

16.



17. A is 9th from left and B is 5th from right position. After interchanging their positions, position of A will be 18th from the left. It means there are 8 people sitting between them. Now position of B from Right =  $(5 + 8) + 1 = 14$

18. Number of students who play cricket =  $25 + 16 = 41$

20.

P	Q	R	S
June	July	August	September
30	31	31	30

21. Series of continuous prime numbers  
 2, 3, 5, 7, 11, 13, 17, 19, 23

22. A E I O U E I O U A I O U A E O  
 A E I U A E I O

26. Weight of 1st type = 18 gm  
 Weight of 2nd type = 12 gm  
 Pure Gold is 24 carat

So,  
 $20 : 4 = 5 : 1 = 6 \times (4)$   
 $15 : 9 = 5 : 3 = 8 \times (2)$

$\therefore 20 : 4 = 24$   
 $\frac{10}{30} : \frac{6}{10} = \frac{16}{40}$   
 $\frac{24}{40} \downarrow$   
 $\frac{18}{40}$   
 $\frac{24}{40} \downarrow$   
 $24$

[ $\therefore$  ratio between 24 and 16 is same as ratio between 18 and 12]

27. R.I. =  $5\% = \frac{1 \rightarrow \text{Interest}}{20 \rightarrow \text{Principal}}$

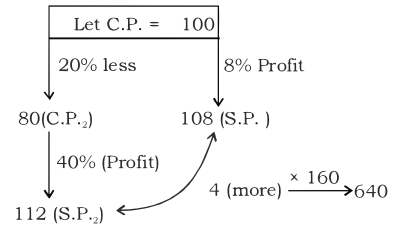
Amount same

$$\left(\frac{21}{20}\right)^3 A = \left(\frac{21}{20}\right)^5 B$$

$$\frac{A}{B} = \left(\frac{21}{20}\right)^2 = \frac{441}{400}$$

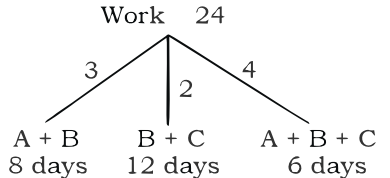
$$A \text{ gets} = \frac{441}{841} \times 2523 = \text{Rs. } 1323$$

28.



- $\therefore$  initial S.P. of Cow (S.P.1) =  $108 \times 160 = \text{Rs. } 17280$

29.



- $\therefore$  One day work of C =  $4 - 3 = 1$   
 One day work of A =  $4 - 2 = 2$   
 So, (A + C) will do the work in

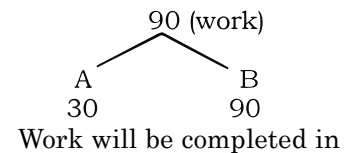
$$= \frac{24}{1+2} = 8 \text{ days}$$

30. Ratio of efficiency of A and B = 3 : 1  
 Ratio of time taken by A and B = 1 : 3

So,

$$3 - 1 = 2 \xrightarrow{\times 30} 60$$

- $\therefore$  Time taken by A = 30,  
 Time taken by B =  $3 \times 30 = 90$



$$= \frac{90}{4} = 22\frac{1}{2} \text{ days}$$

31. Divisor = quotient  $\times$  4  
 Divisor = Remainder  $\times$  2  
 If a is divisor

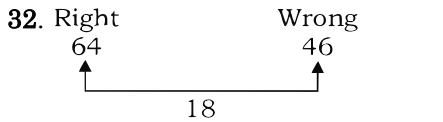
$$\text{Then quotient} = \frac{a}{4}$$

$$\text{Remainder} = \frac{a}{2}$$

We know that  
 dividend = Divisor  $\times$  quotient + remainder

$$b = a \times \frac{a}{4} + \frac{a}{2} = \frac{a^2}{4} + \frac{2a}{4}$$

$$\therefore \frac{a(a+2)}{b} = 4$$



$\therefore$  Total marks decreased = 18  
Total average marks decreased

$$= \frac{18}{200} = 0.9$$

So, actual average of 200 students is =  $57 + 0.9 = 57.09$

33. Let downstream speed =  $x$  km/hr  
Let upstream speed =  $y$  km/hr

$$\therefore \frac{12}{y} + \frac{8}{x} = 3$$

..(i)

and  $\frac{18}{y} + \frac{32}{x} = 7$  ..(ii)

Subtract equation (ii) from [eq<sup>n</sup> (i)  $\times 4$ ]

$$\frac{30}{y} = 12 - 7 = 5$$

$$\Rightarrow y = 6 \text{ km/hr}$$

Put this value in eq. (i)

$$\frac{12}{6} + \frac{8}{x} = 3 \Rightarrow x = 8 \text{ km/hr}$$

So, speed of current down stream speed

$$= \frac{-\text{up stream speed}}{2}$$

$$\Rightarrow \frac{8-6}{2} = 1 \text{ km/hr}$$

34. Let the length of the train =  $x$  m

Then the speed of the train

$$= \frac{x}{8} \text{ m/sec}$$

And  $\frac{x+420}{20} = \frac{x}{8}$

$$\Rightarrow \frac{x+420}{5} = \frac{x}{2} \Rightarrow 2x+840 = 5x$$

$$\Rightarrow x = 280$$

$$\text{speed of the train} = \frac{280}{8} \times \frac{18}{5}$$

$$\text{km/hr} = 126 \text{ km/hr}$$

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

$$x - 2 = 2^{\frac{2}{3}} - 2^{\frac{1}{3}} \dots\dots(i)$$

Cubing both sides

$$\Rightarrow x^3 - 8 - 6x(x-2) = (2)^2 - 2 -$$

$$3 \times 2^{\frac{2}{3}} \times 2^{\frac{1}{3}} \times \left(2^{\frac{2}{3}} - 2^{\frac{1}{3}}\right)$$

$$\Rightarrow x^3 - 8 - 6x^2 + 12x = 4 - 2 -$$

$$3 \times 2(x-2) \quad \text{[from equation]}$$

$$\Rightarrow x^3 - 6x^2 + 12x - 8 = 2 - 6$$

$$(x-2)$$

$$\Rightarrow x^3 - 6x^2 + 18x = 22$$

$$\therefore x^3 - 6x^2 + 18x + 40 = 22 + 40 = 62$$

36. Drawn part =  $\frac{15}{150} = \frac{1}{10}$

Water = initial	:	later
10	:	9
$\frac{10}{100}$	:	$\frac{9}{81}$
	:	$\frac{1}{19}$

So, ratio of water and alcohol =  $81 : 19$

37. Fruits sold = 200 mangoes

$$\text{Profit \%} = \frac{40}{200-40} = \frac{1}{4} = 25\%$$

38.  $\sin \theta = 1 - \sin^2 \theta \Rightarrow \sin = \cos^2 \theta$

$$\therefore \cos^{12} \theta + 3\cos^{10} \theta + 3\cos^8 \theta + \cos^6 \theta - 1$$

$$\Rightarrow \sin^6 \theta + 3\sin^5 \theta + 3\sin^4 \theta + \sin^3 \theta - 1$$

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

$$\Rightarrow (1)^3 - 1 = 0$$

39.  $\tan(5x - 10^\circ) = \cot(5y + 20^\circ)$   
 $\tan(5x - 10^\circ) = \tan[90^\circ - (5y + 20^\circ)]$

$$\therefore 5x - 10^\circ = 90^\circ - 5y - 20^\circ$$

$$\Rightarrow 5x - 10^\circ = 70^\circ - 5y^\circ$$

$$\Rightarrow 5x + 5y = 70 + 10 = 80^\circ$$

$$\Rightarrow x + y = \frac{80}{5} = 16^\circ$$

40.  $x + \frac{1}{x} = 2A$

$$\Rightarrow x^3 + \frac{1}{x^3} + 3 \times x \times \frac{1}{x} \left(x + \frac{1}{x}\right) = (2A)^3$$

(Cubing both sides)

$$\Rightarrow x^3 + \frac{1}{x^3} + 3 \times 2A = 8A^3$$

$$\Rightarrow x^3 + \frac{1}{x^3} = 8A^3 - 6A$$

So, Average of  $x^3$  and

$$\frac{1}{x^3} = \frac{2(4A^3 - 3A)}{2} = 4A^3 - 3A$$

41. Let radius is  $a_1$  and  $a_2$

$$\therefore \frac{a_1^2}{a_2^2} = \frac{9}{16} \Rightarrow \frac{a_1}{a_2} = \frac{3}{4}$$

$\therefore$  Ratio of volume

$$= \frac{a_1^3}{a_2^3} = \left(\frac{3}{4}\right)^3 = \frac{27}{64}$$

42. Volume of pyramid =  $\frac{1}{3} \times \text{area of base} \times \text{height}$

$$\Rightarrow \frac{1}{3} \times 324 \times h = 1296$$

$$h = \frac{1296}{108} = 12$$

$$\text{Area of base} = 324$$

$$a^2 = 324$$

$$a = 18$$

$$\text{Perimeter} = 4 \times a = 72$$

$$\text{Area of slant surface}$$

$$= \frac{1}{2} \times \text{perimeter of base} \times \text{height}$$

$$= \frac{1}{2} \times 72 \times 12 = 432$$

43.  $V_{\text{Cone}} : V_{\text{Cylinder}} : V_{\text{Hemisphere}}$

$$= \frac{1}{3} \pi r^3 : \pi r^2 h : \frac{2}{3} \pi r^3 = \frac{1}{3} : 1 : \frac{2}{3}$$

$$= 1 : 3 : 2$$

44.  $\frac{a^6 + a^4 + a^2 + 1}{a^3} = a^3 + a + \frac{1}{a} + \frac{1}{a^3}$

$$\Rightarrow a^3 + \frac{1}{a^3} + a + \frac{1}{a}$$

If  $a = 2 + \sqrt{3}$

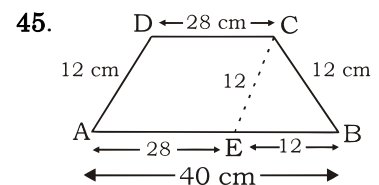
$$\frac{1}{a} = \frac{1}{2 + \sqrt{3}} \times \frac{2 - \sqrt{3}}{2 - \sqrt{3}}$$

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

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

$$a^3 + \frac{1}{a^3} = (4)^3 - 4 \times 3 = 64 - 12 = 52$$

$$\Rightarrow \left(a^3 + \frac{1}{a^3}\right) + \left(a + \frac{1}{a}\right) = 52 + 4 = 56$$



ABCD is a Trapezium

A line CE is drawn parallel to DA intersecting, CE = 12 cm, AE = 28 cm

$\therefore \Delta CEB$  is equilateral triangle

$$\therefore h = \frac{\sqrt{3}}{2} \times 12 = 6\sqrt{3}$$

Area of trapezium

$$= \frac{1}{2} \times \text{sum of parallel side} \times h$$

$$= \frac{1}{2} \times (28 + 40) \times 6\sqrt{3}$$

$$= 204\sqrt{3} \text{ cm}^2$$

46.  $x + y + z = 6 = 1 + 2 + 3$   
 $(x - 1) + (y - 2) + (z - 3) = 0$   
 We know that if  $a + b + c = 0$   
 Then

$$a^3 + b^3 + c^3 = 3abc$$

$$\therefore (x - 1)^3 + (y - 2)^3 + (z - 3)^3 = 3(x - 1)(y - 2)(z - 3)$$

47. Sum of all interior angles =  $(n - 2)180^\circ$

$$(n - 2)180^\circ = 1440^\circ$$

$$n - 2 = \frac{1440}{180} = 8$$

$$n = 8 + 2 = 10$$

48. Length of direct common tangent

$$= \sqrt{(C_1 C_2)^2 - (r_1 - r_2)^2} = \sqrt{(13)^2 - (8 - 3)^2}$$

$$= \sqrt{169 - 25} = \sqrt{144} = 12 \text{ cm}$$

49. Budget on clothing and grocery

$$\Rightarrow 8\% + 20\% \Rightarrow 28\%$$

$$100\% = \text{Rs. } 32000$$

$$28\% = \text{Rs. } 320 \times 28$$

$$= \text{Rs. } 8960$$

50.  $100\% = \text{Rs. } 32000$

$$20\% = \text{Rs. } 320 \times 20 = \text{Rs. } 6400$$

$$\text{So, difference} = \text{Rs. } 6400 -$$

$$\text{Rs. } 4672$$

$$= \text{Rs. } 1728$$

51. Difference =  $19\% - 6\% = 13\%$

$$\text{So, } 100\% = 32000$$

$$13\% = 320 \times 13$$

$$= \text{Rs. } 4160$$

52. Let the second number =  $x$

$$\text{1st number} \times \text{2nd number}$$

$$= \text{L.C.M.} \times \text{H.C.F.}$$

$$189 \times x = 2079 \times 27$$

$$x = 297$$

53. Required days =  $\frac{\text{Days}}{\frac{\text{Men}_2}{\text{Men}_1} + \frac{\text{Women}_2}{\text{Women}_1}}$

$$\Rightarrow \frac{14}{\frac{8}{12} + \frac{16}{18}} \Rightarrow \frac{14 \times 36}{56} = 9 \text{ days}$$

54.

Capital	A	:	B
	3500	:	$x$
Time	$\times 12$	:	$\times 7$
Profit	42000	:	$7x$
	↑ 21000		↗ 63000
	2	:	3 $\times 2100$

$$\therefore 7x = 63000$$

$$\Rightarrow x = \text{Rs. } 9000$$

55.

C.P.	S.P.	M.R.P.	10% discount
200	252	280	10 → discount
			100 → MRP
↑ $\times 4$	↑ $\times 4$	↑ $\times 28$	
50	63	90	
	↑ $\times 100$	↑ $\times 100$	
	90	100	

$$\text{S.P.} = 90$$

$$26\% \text{ Profit} = \frac{13}{50} \rightarrow \text{Profit}$$

C.P. → Rs. 50, S.P. → Rs. 63

56. C. Raja Gopalachari is also referred as 'Rajaji'. He was elected as a president of the Tamil Nadu congress Committee. The Vedaranyam March or Vedaranyam Satyagraha was organised to protest the salt tax imposed by the British Raj in India. The march took place in 1930 and was second of its kind of Dandi March organised by Gandhiji both in the framework of Civil Disobedience Movement. The Vedaranyam March was led by a group of 100 volunteers from the Indian National Congress (INC) under the leadership of Rajaji. It began at Trichinopoly (now Tiruchirappalli) and ended in Vedaranyam, a small coastal town in Tanjore District. The marchers broke the salt law. The campaign ended on 28th April 1930.

58. Every state has a legislative Assembly. Certain states have an Upper House also known as State Legislative Council. There is a governor for each state who is appointed by the President. Governor is the head of the state and the executive power of the state is vested in him. The council of Minister with the Chief Minister as its head advises the Governor in the discharge of the executive functions. The council of Minister of a state is collectively responsible to the legislative Assembly of the state

59. The Labrador Current is a cold current in North Atlantic Ocean which flows from the Arctic Ocean south along the coast of Labrador and passes around New Foundland along the east coast of Nova Scotia. It is the continuation of west Greenland current and the Baffin Island current. At the Grand Banks in south east of New foundland it meets the warm Gulfstream. The combination of these two currents produces heavy fogs and creates richest fishing grounds in the world. Labrador current produces cooling effect on Canadian Atlantic provinces and USA upper North East coast.

60. Bats use ultrasonic sound for navigation. Their ability to catch flying insects while flying full speed in pitch darkness is astounding. Their sophisticated

echolocation permits them to distinguish between a moth and a falling leaf.

61. Persistence of vision is the theory where an afterimage is thought to persist for approximately one-sixteenth of a second on the retina and believed to be the explanation for motion perception. In a moving camera, each picture leads into the next one, so they blur together to make a single movie image. This is known as persistence of vision.

62. The fuse wire works on the principle of Joules law of heating. The main objective of using fuse wire in electric circuit is to provide protection against short circuit or overloading of current. When large current passes in the circuits, the fuse wire burns and breaks the circuit. So, material used in fuse wire should have high resistance and low melting point. Due to high resistance wire heats up quickly, when huge current flows. The temperature around fuse wire rapidly rises, it reaches to the melting point of the material it burns and protects the circuit. Material used as fuse wire is an alloy of tin and lead.

64. In 1951, Edward Teller invented Hydrogen Bomb. It is a weapon that uses a mixture of fission and fusion to produce a massive explosion.

68. Hydrolysis is degradation of chemical bond by the addition of water. When a carbohydrate is broken into its component sugar molecules by hydrolysis like sucrose broken down into glucose and fructose, this is termed as saccharification.

69. Refrigeration is a process of moving heat from one location to another. The heat transport is driven by mechanical work, magnetism, electricity, laser etc. Its applications are household refrigerators, industrial freezers, cryogenics and air conditioning. Refrigeration slows bacterial action to a crawl so that it takes food much longer to spoil.

72. Chloromycetin is used in the treatment of infections caused by bacteria. It works by killing bacteria or preventing their growth.