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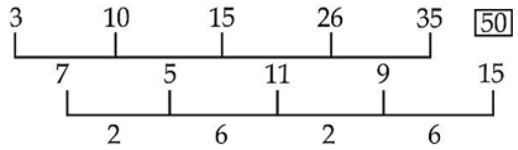
Solutions

S1. Ans.(a)
Sol. $+9^2, +11^2, +13^2, +15^2$…….
∴ ? = 1157 + 289 = 1446

S2. Ans.(d)
Sol. $-9^2, -7^2, -5^2$…….
∴ ? = 1394 - 25 = 1369

S3. Ans.(c)
Sol. $+4^2, +5^2, +6^2, +7^2$……
∴ ? = 134 + 64 = 198

S4. Ans.(b)
Sol.



S5. Ans.(b)
Sol. –103, –103, –103……
∴ ? = 1337 - 103 = 1234

S6. Ans.(a)
Sol. Required Probability
$= \left(\frac{^3C_1}{^7C_1} + \frac{^4C_1}{^7C_1}\right) \times \frac{1}{2} = \frac{1}{2}$

S7. Ans.(a)
Sol. Favorable cases = (4, 4), (4, 6), (6, 4) or (6, 6)
Required probability= $\frac{4}{36} = \frac{1}{9}$

S8. Ans.(b)
Sol. Possible number of ways = Two black and one red or one black and two red.
$= {}^{26}C_2 \times {}^{26}C_1 + {}^{26}C_1 \times {}^{26}C_2$
$= 2 \times 13 \times 25 \times 26$
Total number of ways = $^{52}C_3$
$= \frac{52 \times 51 \times 50}{1 \times 2 \times 3}$
$= 26 \times 17 \times 50$
Probability of the event
$= \frac{2 \times 13 \times 25 \times 26}{26 \times 17 \times 50} = \frac{13}{17}$

S9. Ans.(d)

Sol. At least one girl = Total ways – ways of no girl

$= {}^{10}c_4 - {}^{4}c_4$

$= \frac{10 \times 9 \times 8 \times 7}{4 \times 3 \times 2} - 1$

= 210 – 1 = 209

S10. Ans.(a)

Sol. For a number to be even, last digit of that number must be an even digit.

∴ Required ways = $\underline{4} \times 4 \times \underline{2} = 32$

S11. Ans.(e)

Sol. Required fund = (38 –12) % of 16,00,00,000

= Rs. 4,16,00,000

S12. Ans.(a)

Sol. Required remaining amount

= 42% of 16 cr – 25% of 16 cr

= 17% of 16 cr

= 2.72 crore

S13. Ans.(a)

Sol. Required percentage = $\frac{16}{38} \times 100 = 42\frac{2}{19}\%$

S14. Ans.(c)

Sol. Required amount for payment = 35% of 16 crore

$= \frac{35 \times 16}{100}$ = Rs. 5.6 crore

S15. Ans.(c)

Sol. Fund acquired from ministry of home affairs = 42% of 16 crore

$= \frac{42 \times 16}{100}$ = Rs. 6.72 crore

S16. Ans.(a)

Sol. Quantity I. Hole can empty the tank in 8 hours

Due to an inlet it takes 12 hours.

LCM of 8 and 12 = 24

Efficiency of inlet pipe= $\frac{24}{8} - \frac{24}{12} = 1$

So, inlet pipe can full it in $\frac{24}{1} = 24\ hour$

Water in tank $= 24 \times 60 \times 6 = 8640$ litre

Quantity II. $CI = P\left(1+\frac{R}{100}\right)^t - P$

$2448 = P\left[\left(1+\frac{R}{100}\right)^t - 1\right]$

$2448 = P\left[\left(1+\frac{4}{100}\right)^2 - 1\right]$

$2448 = P\left[\frac{676}{625} - 1\right]$

$2448 = P\left[\frac{51}{625}\right]$

$\therefore P = \frac{2448\times625}{51} = 30000$

$\therefore SI = \frac{30000\times4\times2}{100} = \text{Rs. } 2400$

From here, QI > QII

S17. Ans.(b)

Sol. Quantity I. Let present age of Abhishek and Rohit is x and y respectively.

ATQ,

$\frac{x-4}{y-4} = \frac{4}{5}$

$5x - 4y = 4$ ___(I)

$\frac{x+2}{y+2} = \frac{5}{6}$

$6x - 5y = -2$ ___(II)

Solving (I) and (II)

X = 28, y = 34

So, average age of Abhishek and Rohit = $\frac{28+34}{2}$ = 31 years

Quantity II. Let initial quantity of milk = 3x

Let initial quantity of water = x

ATQ,

$\frac{3x-15+15}{x-5} = \frac{4}{1}$

$\frac{3x}{x-5} = \frac{4}{1}$

$3x = 4x - 20$

$x = 20$

So, initial quantity of mixture = (3x + x)

$= 4 \times 20$

$= 80$ L

$\therefore$ Quantity I < Quantity II

S18. Ans.(b)

Sol. Total quantity of acid $= \frac{6}{7}+\frac{5}{7}+\frac{3}{4} = \frac{65}{28}$

& total quantity of water

$= \frac{1}{7}+\frac{2}{7}+\frac{1}{4} = \frac{19}{28}$

$\therefore$ Required ratio = 65: 19

S19. Ans.(c)

Sol. Initial quantity of acid = $\frac{200}{100} \times 15 = 30\ \ell$

Let x litre of second solution is added.

$\therefore \frac{30 + 0.3x}{200 + x} > \frac{20}{100}$ & $\frac{30 + 0.3x}{200 + x} < \frac{25}{100}$

$\Rightarrow \frac{30 + 0.3x}{200 + x} > \frac{1}{5}$ & $\frac{30 + 0.3x}{200 + x} < \frac{1}{4}$

$\Rightarrow 200 + x < 150 + 1.5x$ & $200 + x > 120 + 1.2x$

$\Rightarrow x > 100$ & $x < 400$

$\Rightarrow 100\ell < x < 400\ell$

S20. Ans.(c)

Sol. Area of road is = 16 × 1.5 + 24 × 1.5 – 1.5 × 1.5

= 24 + 36 – 2.25

= 57.75

So, total cost of road making = 57.75 × 310 Rs.

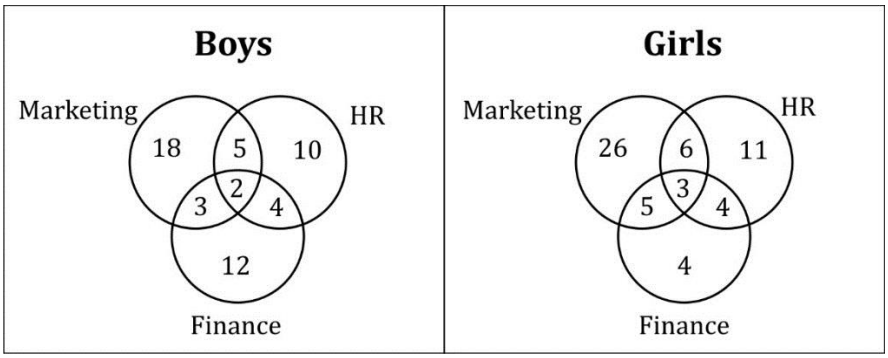
= Rs. 17902.5

Solutions (21-25):

Total students = 150

Boys = 70, Girls = 80

Discipline	Boys (70)	Girls (80)
Marketing	40% of 70 = 28	50% of 80 = 40
HR	30% of 70 = 21	30% of 80 = 24
Finance	30% of 70 = 21	20% of 80 = 16
HR +Marketing	7	9
HR+ Finance	6	7
Marketing+ Finance	5	8
Marketing + Finance +HR	2	3



S21. Ans.(a)
Sol. Students those are enrolled in all three disciplines = 2 + 3 = 5
∴ Required percentage = $\frac{5}{150} \times 100 = 3.3\%$

S22 Ans.(b)
Sol. The ratio of boys to girls only in marketing disciplines = 18 : 26 = 9 : 13

S23. Ans.(c)
Sol. The ratio of the number of boys in marketing and finance both and girls only in finance = 5 : 4

S24. Ans.(d)
Sol. Boys in marketing discipline = 28
Girls in HR discipline = 24
Required percentage = $\frac{28-24}{24} \times 100\% \Rightarrow \frac{4}{24} \times 100\% = 16\frac{2}{3}\%$

S25. Ans.(a)
Sol. The ratio of boys to girls enrolled only in HR discipline is = 10 : 11

S26. Ans.(b)
Sol. $23.8 + 13.2 = 37$

S27. Ans.(a)
Sol. $81.2 + 52.2 = 133.4$

S28. Ans.(a)
Sol. $26 + 16 = 42$

S29. Ans.(c)
Sol. $149834 - 85973 = 63861$

S30. Ans.(a)
Sol. $66.6 + 99.9 = 166.5$

S31. Ans.(a)
Sol. $p + q + r + s = 64$ .....(i)
$p + 3 = q - 3 = 3r = \frac{S}{3} = K$ (say)
$\therefore p = K - 3,\ q = K + 3,\ r = \frac{K}{3},\ s = 3K$
∴ from (i)
$(K - 3) + (K + 3) + \left(\frac{K}{3}\right) + (3K) = 64$
$\Rightarrow K = 12$
$\therefore p = 9, q = 15, r = 4, s = 36$
So, required difference = 36 – 4 = 32

S32. Ans.(a)

Sol. Total investment = (13 + 23 + 8) % of monthly salary

= 44% of salary

Now, 13% = 8554

$\therefore 44\% = \frac{8554}{13} \times 44 = \text{Rs. } 28952$

S33. Ans.(c)

Sol. Let the highest score be x

$\therefore 40 \times 50 = 38 \times 48 + x + x - 172$

$\Rightarrow 2000 = 1824 + 2x - 172$

$\Rightarrow x = 174$ runs.

S34. Ans.(c)

Sol.

$\frac{5x-16\times\frac{5}{8}}{3x-16\times\frac{3}{8}+16} = \frac{3}{5}$

$\Rightarrow \frac{5x-10}{3x+10} = \frac{3}{5}$

$\Rightarrow 25x - 50 = 9x + 30$

$\Rightarrow x = 5$

$\therefore$ volume of vessel = (5 + 3) × 5 = 40ℓ

S35. Ans.(c)

Sol. Let x ltr. of acid drawn initially,

$\therefore \left(1 - \frac{x}{54}\right)^2 = \frac{24}{54}$

$\Rightarrow 2916 + x^2 - 108x = 24 \times 54$

$\Rightarrow x^2 - 108x + 1620 = 0$

$\Rightarrow x = 18\ \ell$ (Neglecting $x = 90$ because total capacity is 54 ℓ)

S36. Ans.(e)

Sol. $\frac{460\times850}{100} + \frac{270\times6280}{100} \times 6284 - 1486$

$= 3910 - 1486 + 16956 \approx 19380$

S37. Ans.(e)

Sol. 28 = (3.5 + ?)2

$\Rightarrow 14 = 3.5 + ?$

$\Rightarrow ? = 14 - 3.5 = 10.5$

S38. Ans.(c)

Sol. $\approx 4 \times 24 - 31$

$\Rightarrow 96 - 31 = 65$

S39. Ans.(d)

Sol. $(1702 \div 68) \times 136.05 = 50 \times ?$

$\approx \frac{1702}{68} \times 136 = 50 \times ?$

$\therefore ? = \frac{3400}{50} = 68$

S40. Ans.(d)

Sol.

$\approx 70\% \times 1400 - 14\% \times 1300$

$\approx 980 - 182 = 798$

≈ 800

S41. Ans.(c)

Sol. Required average

$= \frac{1}{5}(0.4 \times 240 + 0.4 \times 260 + 0.4 \times 270 + 0.45 \times 260 + 0.5 \times 260) \times 1000$

$= \frac{1}{5} \times 555 \times 1000 = 111000$

S42. Ans.(b)

Sol. Capacity in 2010 $= (170 + 28 + 240) \times 1000 = 438000$

Total utilization in 2014 $= (0.6 \times 225 + 0.55 \times 40 + 0.5 \times 260) \times 1000 = 287000$

$\therefore$ Required percentage $= \frac{151000}{287000} \times 100 \approx 52.6\%$

S43. Ans.(e)

Sol. Production of A $= (170 + 200) \times 1000 = 370000$

Utilization of C $= (0.4 \times 270 + 0.45 \times 260 + 0.5 \times 260) \times 1000 = 355000$

$\therefore$ Required difference $= 15000$

S44. Ans.(b)

Sol. Total unutilized in 2013 $= (0.4 \times 210 + 0.5 \times 40 + 0.55 \times 260) \times 1000 = 247000$

$\therefore$ unutilized at cost $= \frac{20}{100} \times 247000 = 49{,}400$

S45. Ans.(e)

Sol. Required ratio $= \frac{200 + 260}{(0.6 \times 210) - (0.45 \times 260)} = \frac{460}{9}$

S46. Ans.(a)

Sol. Let the rate of interest be R percent per annum.

$\therefore \frac{400 \times 2 \times R}{100} + \frac{550 \times 4 \times R}{100} + \frac{1200 \times 6 \times R}{100} = 1020$

$\Rightarrow 8R + 22R + 72R = 1020$

$\Rightarrow 102\ R = 1020$

$\Rightarrow R = \frac{1020}{102} = 10\%$

S47. Ans.(a)

Sol. Let Rs. P be lent at 12% then Rs. (12,000–P) is lent at 16%, then

$\therefore \frac{P \times 3 \times 12}{100} = \frac{(12000 - P) \times 9 \times 16}{200}$

$\Rightarrow \frac{P}{12000 - P} = \frac{9 \times 16 \times 100}{3 \times 12 \times 200} = \frac{2}{1} = 2:1$

S48. Ans.(c)

Sol. 110% of CP – 90% of CP = 80

20%of CP = 80

CP = $\frac{80}{20} \times 100 = Rs.400$

S49. Ans.(c)

Sol. SP after first discount = $\frac{1600 \times 90}{100} = Rs.1440$

∴ Second discount = 1440 – 1224 = Rs. 216

$\therefore \frac{1440 \times x}{100} = 216$

$\therefore x = \frac{216 \times 100}{1440} = 15\%$

S50. Ans.(c)

Sol. Let the sum be P and rate of interest per annum be R.

$\frac{6750}{4500} = \frac{P\left(1+\frac{R}{100}\right)^4}{P\left(1+\frac{R}{100}\right)^2}$

$\frac{6750}{4500} = \left(1 + \frac{R}{100}\right)^2$

$\Rightarrow \left(1 + \frac{R}{100}\right)^2 = \frac{9}{6} = \frac{3}{2}$

So, P × $\frac{3}{2}$ = 4500

$\Rightarrow$ P = $\frac{4500 \times 2}{3}$ = Rs. 3000

S51. Ans.(b)

Sol. ? ≈ 400 ÷ 8 × 12 + 245 – 190 ≃ 655

S52. Ans.(c)

Sol. $\frac{4}{5}$ of ? ≃ $\frac{48}{100} \times 450 + \frac{52}{100} \times 440$

? ≃ 556

S53. Ans.(d)

Sol.? ≃ 12 + 26 + 6 – 11 ≃ 33

S54. Ans.(a)

Sol.? ≃ $\frac{43}{100} \times 800 + \frac{57}{100} \times 900$ ≃ 857

S55. Ans.(d)

Sol. $? \simeq \frac{115}{100} \times 560 + \frac{84}{100} \times 420 \simeq 997$

S56. Ans.(c)

Sol. Let total no. of students who applied for the post of JE and AE from UP are 81x and 61x respectively.

∴ 81x + 61x = 1,15,700 – (40,000 + 10,500 + 8,400)

= 56,800 ⇒ x = 400

∴ Required answer = 61 × 400 = 24,400

S57. Ans.(b)

Sol. Total candidates from Delhi who applied for the post of AE

= 5 × 16,880 – (20,000 + 36,000 + 7,200 + 4,800) = 16,400

∴ Required percentage = $\frac{16,400}{7,200} \times 100 = 227\frac{7}{9}\%$

S58. Ans.(d)

Sol. Required answer = $\frac{150}{100} \times \frac{60}{100} \times 16,400 = 14,760$

S59. Ans.(a)

Sol. Required total no. of candidates

= 12,500 + 8,400 + $\frac{80}{100}$ × 20,000 + 5,400

= 42,300

S60. Ans.(c)

Sol. $\left(100 - \frac{225}{14}\right)\% = \frac{1175}{1400} = \frac{47}{56}\%$

$\therefore \frac{47}{56} \rightarrow (8400 + 4800 + 2400 + 3200)$

⇒ Total no. of candidates from all states together

$= \frac{56}{47} \times 18,800 = 22,400$

∴ Required answer = $\frac{225}{1400} \times 22,400$

= 3,600

S61. Ans.(d)

Sol. From A, R + F + M +S = 90

From B, R + M + S = $18\frac{1}{3} \times 3$

From C, M + S = $\frac{4}{7} \times 2F$

From all three statements together, the answer can be obtained.

S62. Ans.(a)

Sol. From I & II,

Let CP = x

S.P = $\frac{6x}{5}$

Now, New S.P = $\frac{6x}{5} \times \frac{90}{100} = \frac{54x}{50}$

$\Rightarrow \frac{54x}{50} - x = 1200$

$\Rightarrow x = 15000$

$\therefore$ SP. = 18000

& from III & I, we can obtain selling price.

& from II & III,

Let S.P. = x

When 10% discount,

S.P. = $\frac{9x}{10}$

$\therefore \frac{9x}{10} - 15000 = 1200$

$\Rightarrow x = 18000$

Thus, any two of the three statements are required.

S63. Ans.(b)

Sol.

12G + 8C $\rightarrow$ 24 days

$\Rightarrow$ 3G + 2C $\rightarrow$ 24×4 days

From A,

2M = (3G + 2C)

$\Rightarrow$ 2M $\rightarrow$ 24 × 4 days

$\Rightarrow$ 1M $\rightarrow$ 24 × 4 × 2 days

From B, 3G = 6C

$\Rightarrow$ G = 2C, $\Rightarrow$ (12 + 4) G $\rightarrow$ 24 days

$\Rightarrow$ 1G $\rightarrow$ 24 × 16 days

$\therefore from\ A + B$, 12M + 12G $\rightarrow \left(\frac{1}{24\times8} + \frac{1}{24\times16}\right) \times 12$

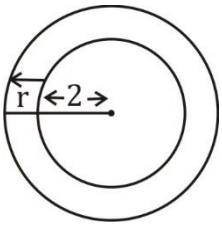
$\rightarrow \frac{1}{16} + \frac{1}{32} \rightarrow \frac{32}{3}$ days

From C,

Not known no. of persons.

S64. Ans.(d)

Sol. Let the thickness of gold be r.



Then, volume of gold = Volume of ball – Volume of lead ball

Volume of gold

$= \frac{4}{3}\pi(2+r)^3 - \frac{4}{3}\pi(2)^3$ .....(i)

Now, it is given that Volume of gold

= Volume of lead ball

So, $\frac{4}{3}\pi(2)^3 = \frac{4}{3}\pi(2+r)^3 - \frac{4}{3}\pi(2)^3$

$\frac{4}{3}\pi(2)^3 + \frac{4}{3}\pi(2)^3 = \frac{4}{3}\pi(2+r)^3$

$\Rightarrow \frac{8}{3}\pi(2)^3 = \frac{4}{3}\pi(2+r)^3$

$\Rightarrow 2(2)^3 = (2+r)^3$

$\Rightarrow \sqrt[3]{2} \times 2 = 2 + r$

$\Rightarrow 1.259 \times 2 = 2 + r$

$(\because \sqrt[3]{2} = 1.259)$

$\Rightarrow 2.518 = 2 + r$

$\therefore r = 2.518 - 2 = 0.518$ cm

S65. Ans.(d)

Sol. Given, $2\pi r = 44$

$r = \frac{44}{2\pi} = \frac{22}{\pi} = \frac{22\times7}{22} = 7cm$

Inner radius of pipe = 7 – 1

= 6 cm

Volume of pipe = $\pi r^2 h$

$= \pi \times 6^2 \times 7$

$= \frac{22}{7} \times 6^2 \times 7$

$= 792\ cm^3$

S66. Ans.(c)

Sol.

$? \simeq \frac{68}{100} \times 1400 - \frac{14}{100} \times 1300 \simeq 770$

S67. Ans.(d)

Sol.

$? \simeq 5467 - 3245 + 1123 - 2310 \simeq 1035$

S68. Ans.(d)

Sol.

$? \simeq \frac{6000}{10} + 671 - 140$

$\simeq 1131$

$\simeq 1130$

S69. Ans.(e)
Sol.
$? \simeq 900 - 81 - 125$
$\simeq 694$

S70. Ans.(b)
Sol.
$? \simeq \frac{56 \times 24 \times 8}{16}$
$\simeq 672$
$\simeq 670$

S71. Ans.(a)
Sol. Let population of females and children in colony A be 3x and 7x respectively.
$\therefore 10x = \frac{75}{100} \times 2400$
x = 180
No. of females in colony A in year 2017 = $540 \times \frac{120}{100} = 648$
∴ Required no. of males and children together in colony A in 2017 = 2400 – 648
= 1752

S72. Ans.(c)
Sol. Total no. of males in colony C $= \frac{50}{100} \times \frac{100}{30} \times 180$
= 300
No. of males in colony D $= \frac{1}{3} \times \frac{84}{100} \times 800$
= 224
∴ Required difference = 300 – 224
= 76

S73. Ans.(b)
Sol. Total population of males in colony B
$= \frac{40}{100} \times \frac{2}{5} \times \frac{125}{100} \times 2400$
= 480
And that of children in colony C $= \frac{30}{100} \times \frac{3}{5} \times \frac{125}{100} \times 2400$
= 540
∴ Required ratio = $\frac{480}{540} = 8 : 9$

S74. Ans.(d)
Sol. Let males in colony D = 2x
Females in colony A = 5x
Let population of children in colony A = a%
∴ No. of children in colony A in 2017 $= \frac{6a}{5}\%$
From here we cannot find the required answer

S75. Ans.(e)

Sol. Let total population of colony C = 5x

& that of colony E = 4x

Required Percent $= \frac{0.4\times4x-0.3\times5x}{0.3\times5x} \times 100$

$= \frac{100}{15}\% = 6.67\%$

S76. Ans.(b)

Sol. 1/4 min = $\frac{1}{4} \times 60$ sec = 15 sec

1/6 min = $\frac{1}{6} \times 60$ sec = 10 sec

Speed of the first train= $\frac{420}{15} = 28\ m/sec$

Speed of the second train= $\frac{420}{10} = 42\ m/sec$

Total speed in opposite direction= 28+42 = 70 m/sec

Total distance covered = 420+420 = 840 meter

Time= $\frac{840}{70} = 12\ sec$

S77. Ans.(d)

Sol. After servicing speed = 65 km/h

Time = 5 hours

Distance = Speed × Time = 65 ×5 = 325 km

Before servicing, speed = 40 km/h.

So, time taken

$= \frac{\text{Distance}}{\text{Speed}} = \frac{325}{40}$

= 8 hours (approx.)

S78. Ans.(a)

Sol. Let the speed of boat in still water = u

Speed in downstream = u+4

Speed in upstream= u-4

A/q, $\frac{6}{u+4} + \frac{6}{u-4} = 2$

$6u = u^2-16$

$u^2-6u-16=0$

$(u+2)(u-8)=0$

U=8

S79. Ans.(b)

Sol. Let the speed of boat in still water be x km/hr

ATQ

$x + 3 + x - 3 = 36$

$x = 18$

Required time=$\frac{52.5}{21} = 2.5\ hr$

S80. Ans.(a)
Sol. Let slower train moves with x km/hr . Hence speed of faster train will be (x + 6) kmph
∴ (x+ x+ 6) × 5 = 160
Or, 10x + 30 =160
Or, x = 13
∴speed of faster train = 13 + 6 = 19 km/hr

S81. Ans.(a)
Sol. ? – 4 = 5 + 6
⇒ ? =15

S82. Ans.(c)
Sol. ? = 2.1020

S83. Ans.(e)
Sol.
$$\frac{?}{100} \times 540 - 40 = 196$$
$$\Rightarrow ? = 43\frac{19}{27}$$

S84. Ans.(d)
Sol.
$$? = \frac{(0.356 - 0.106)^2}{(0.632 + 0.368)^2} = 0.0625$$

S85. Ans.(c)
Sol.
$$? = 4 \times \left(\frac{9}{8} \times \frac{4}{3} \div \frac{3}{4} \times \frac{2}{3}\right) = 12$$

S86. Ans.(a)
Sol.
$$\frac{\frac{325}{250}}{\frac{550}{375}} = \frac{325 \times 375}{250 \times 550} = 39 : 44$$

S87. Ans.(c)
Sol. 2016: No. of consumers = $\frac{220}{100}[225] = 495$ thousand
Electricity consumption = 550 Lacs
∴ Electricity consumption per consumer = $\frac{550 \times 100000}{495 \times 1000}$
= 111 units per consumer
2015: Electricity consumption per consumer = $\frac{550 \times 100000}{375000}$
≈ 147 units per consumer
Hence, the Impact is reduction of 36 units per consumer

S88. Ans.(b)

Sol. Total consumer all over the year = 225 + 250 + 300 + 350 + 375 = 1500 thousand

Desired value = $\frac{325\times100000}{1500000} = 21.67$ times approx

S89. Ans.(d)

Sol. Total units in 2011 and 2013 = 650 Lacs

Total units in 2012 and 2014 = 900 Lacs

Desired value $= \frac{250}{900} \times 100 \approx 28\%$ approx.

S90. Ans.(c)

Sol. It is clear from the graph that unit consumption is highest in 2014 while consumers-electricity unit difference is maximum as well. Hence, Ratio of unit consumption to the number of consumers is maximum in 2014.

S91. Ans.(a)

Sol.

$\frac{3}{A} + \frac{27}{2B} = 1$ .....(i)

$= \frac{9}{2A} + \frac{9}{B} = 1$ .....(ii)

Multiply (i) by 3/2 and on solving

A will take 7.5 days and B will take 22.5 days.

S92. Ans.(c)

Sol. Let time taken by all to complete the work =x hours

Then,

A will take $= (x + 6)h$

B will take $= (x + 1)h$

C will take $= (2x)h$

So,

$$\frac{1}{(x+6)} + \frac{1}{x+1} + \frac{1}{2x} = \frac{1}{x}$$

$$= \frac{2x^2 + 2x + 2x^2 + 12x + x^2 + 7x + 6}{(x+6)(x+1)(2x)} = \frac{1}{x}$$

$5x^2 + 21x + 6 = 2x^2 + 14x + 12$

$3x^2 + 7x - 6 = 0$

$3x^2 + 9x - 2x - 6 = 0$

$3x(x + 3) - 2(x + 3) = 0$

$x = \frac{2}{3}, -3$

so,

$x = 40$ mins

S93. Ans.(c)

Sol. Let filling capacity be x m^3/min

So, emptying capacity = $(x + 10)$ m^3/min

According to question

$\frac{2400}{x} - \frac{2400}{x+10} = 8$

$\Rightarrow 2400\left(\frac{x+10-x}{x(x+10)}\right) = 8$

$\Rightarrow x^2 + 10x - 3000 = 0$

$\Rightarrow x = 50$ m^3/min

S94. Ans.(b)

Sol. Using formula,

$\frac{S(S+5)}{5} \times 4 = 600$

$S(S+5) = 750 = 25\ (25+5)$

Speed of the train = 25 km/hr

Alternately,

$\frac{600}{s} - \frac{600}{s+5} = 4$

$\frac{600s + 3000 - 600s}{s(s+5)} = 4$

$s = 25$ km/hr

S95. Ans.(d)

Sol. Let the distance covered by cycle=x

$\frac{x}{15} + \frac{90-x}{20} = 5$

$\frac{4x + 270 - 3x}{60} = 5$

x=30 km

S96. Ans.(d)

Sol. Series is $-11, -(11 \times 2), -(11 \times 3), -(11 \times 4), \ldots\ldots$

S97. Ans.(b)

Sol. Series is $\times 1 + 1, \times 1.5 + 1, \times 2 + 1, \times 2.5 + 1, \ldots\ldots$

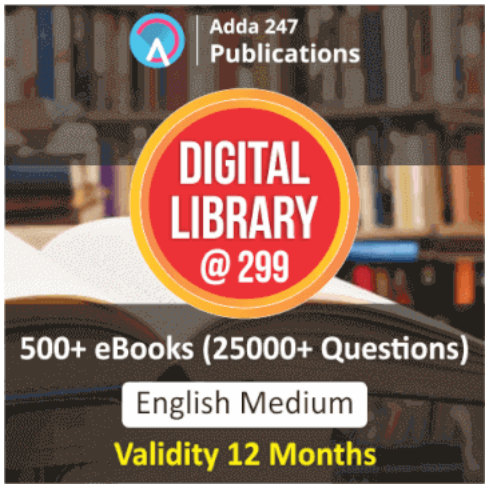
S98. Ans.(c)

Sol. Series is $+(1\times 12), -(2 \times 12), +(3 \times 12), -(4 \times 12), +(5 \times 12), \ldots\ldots$

S99. Ans.(e)

Sol. Series is $\times 2 - (1 \times 5), \times 2 - (2 \times 5), \times 2 - (3 \times 5), \times 2 - (4 \times 5), \ldots\ldots$

S100. Ans.(e)
Sol. Series is × 2.5 + 20,× 2.5 + 20,× 2.5 + 20, … ….



S101. Ans.(b)
Sol. Total population of Delhi who is not smoking
$= \frac{67500}{20} \times 100 - 67,500$
= 2,70,000
Required percentage $= \frac{\frac{5}{9} \times 67,500}{2,70,000} \times 100$
$\simeq 14\%$

S102. Ans.(c)
Sol. Total persons who died due to smoking in Mumbai
$= \frac{82500}{4}$
= 20,625
Required percentage $= \frac{20625}{\frac{2}{5} \times 82500} \times 100$
= 62.5%

S103. Ans.(d)
Sol. Total production in Lucknow who is not smoker
$= 52500 \times \frac{5}{3} - 52500$
= 35,000
$\therefore$ Required ratio $= \frac{\frac{11}{15} \times 52500}{\frac{2}{3} \times 52,500}$
$= \frac{11}{10}$

S104. Ans.(b)
Sol. Required difference
$= \frac{1}{5} \times \left[\frac{(5-4)}{9} \times 67,500 + \frac{(11-4)}{15} \times 52,500 + \frac{(3-2)}{5} \times 82,500 + \frac{(5-1)}{6} \times 45,000 + \frac{(17-8)}{25} \times 75,000\right]$
$= \frac{1}{5} \times 105,500$
= 21, 100

S105. Ans.(c)
Sol. Required ratio
$= \left(\frac{90}{100} \times \frac{5}{9} \times 67,500\right) : \left(\frac{80}{100} \times \frac{5}{6} \times 45,000\right) : \left(\frac{75}{100} \times \frac{17}{25} \times 75,000\right)$
= 33,750 : 30,000 : 38,250
= 45 : 40 : 51

S106. Ans.(c)

Sol. Let Arun takes x and Rahim takes $3x$ days to finish the work

$\because 3x - x = 20 \Rightarrow x = 10$

Rahim's time to finish the work = 3 × 10 = 30 days

$\therefore$ (Arun + Rahim)'s 1 days work = $\frac{1}{10} + \frac{1}{30} = \frac{4}{30}$

$\therefore$ (Arun + Rahim) will finish the work in $\frac{15}{2}$ days

i.e. $7\frac{1}{2}$ days.

S107. Ans.(b)

Sol. 1 man con complete the work in 16 × 24 = 384 days

1 man per day work = $\frac{1}{384}$

16 men per day work = $\frac{16}{384} = \frac{1}{24}$

16 women per day work = $\frac{16}{32 \times 24} = \frac{1}{48}$

(16 men + 16 women) per day work = $\frac{1}{24} + \frac{1}{48} = \frac{1}{16}$

Work done in 12 days = $\frac{12}{16}$

Remaining work = $1 - \frac{12}{16} = \frac{1}{4}$

This work should be completed in 2 days

So per day work should be $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

But right now only $\frac{1}{16}$ work per day is being done.

So $\left(\frac{1}{8} - \frac{1}{16} = \frac{1}{16}\right)$ more work is required for which $\frac{\frac{1}{16}}{\frac{1}{384}}$ = 24 more man are required.

S108. Ans.(e)

Sol. Rinki: 15 days → 36% of the work

$\therefore$ 20 days → 48% of the work

Total work done by Rinki = 48% + 36% = 84%

Which means kirti did only 16% of the work in 20 days while comparing the working efficiency

	Rinki		kirti
In 20 days,	48%		16%
$\therefore$ **Efficiency**	**3**	:	**1**

S109. Ans.(e)

Sol. First train speed = 45 km/hr

2nd train speed = 60 km/hr

$\therefore$ Difference in distance covered in 1 hr = 15 km

S110. Ans.(c)
Sol. Let the cost price of one table be x.
Then, cost price of other table will be (2200 – x).
$x \times \frac{95}{100} + (2200 - x) \times \frac{106}{100} = 2200$
⇒ 95x + 233200 – 106x = 220000
⇒ 11x = 13200
⇒ x = Rs 1200
And, 2200 – x = Rs 1000

S111. Ans.(d)
Sol. Income in the year of 2008 by R
$= \frac{100}{9} \times 18.9 \times \frac{109}{100}$
= Rs. 228.9 lakhs

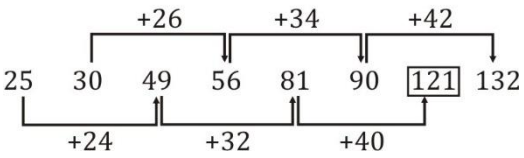
S112. Ans.(a)
Sol.
$\%\ \text{rise} = \frac{14 - 10}{10} \times 100 = 40\%$

S113. Ans.(a)
Sol. Total expenditure of P in 2007
$= \frac{100}{7} \times 2.1 = 30$ lakhs

S114. Ans.(c)
Sol. Average % profit of company S
$= \frac{1}{6} \times (7 + 8 + 13 + 14 + 15 + 15)$
$= \frac{1}{6} \times 72 = 12\%$

S115. Ans.(b)
Sol. Average of percentage value of profit earned by all companies except Q in the year 2005
$= \frac{1}{5} \times (9 + 5 + 8 + 12 + 6)$
$= \frac{1}{5} \times 40 = 8\%$
∴ Required difference = 10 – 8 = 2%

S116. Ans.(d)
Sol. Series is



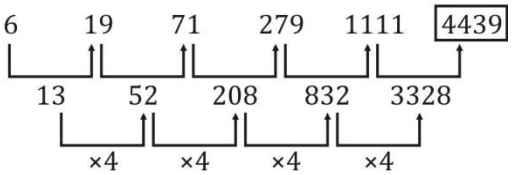
S117. Ans.(b)

Sol. Pattern is ÷8, ÷6, ÷4, ÷2

∴ ? = 12.5 ÷ 4 = 3.125

S118. Ans.(a)

Sol. Series is



S119. Ans.(d)

Sol. Pattern is +14×1, +14×3, +14×9, +14×27

∴ ? = 564 + 14 × 81 = 1698

S120. Ans.(b)

Sol. Pattern is ×1+1, ×2+2, ×3+3, ×4+4, ×5+5

∴ ? = 352 × 5 + 5 = 1765

S121. Ans.(a)

Sol. From 1, Let one stem is bought at Rs. x and other will be bought at Rs.$(7500 - x)$

According to question,

$x \times \frac{116}{100} + (7500 - x) \times \frac{86}{100} = 7500$

$\Rightarrow 116x + 7500 \times 86 - 86x = 7{,}50{,}000$

$\Rightarrow x = 3500$

And, other's selling price is = 7500 – 3500

= 4000

∴ Required difference = 4000 – 3500 = 500

From 2, Let cost price of B = Rs. x

∴ CP of A = (x + 200)

$\therefore \frac{90}{100} \times (x + 200) + \frac{125}{100} \times x = \frac{104}{100} \times (2x + 200)$

⇒ 90x + 18000 + 125x = 208x + 20800

⇒ x = 400

Quantity 1 > Quantity 2

S122. Ans.(a)

Sol. From 1, Let speeds of A and B is 3x kmph and 4x kmph respectively.

Let time taken by A = t hours

And time taken by B,

$= \left(t - \frac{3}{4}\right)$ hours

$\therefore 3x \times t = 4x \times \left(t - \frac{3}{4}\right)$

$\Rightarrow 3t = 4t - 3$

$\Rightarrow t = 3$ hours

$\therefore$ Required distance

$= \frac{4}{7} \times 28 \times \frac{9}{4} + \frac{3}{7} \times 28 \times 3$

= 72 km

From 2, Total cost to the shopkeeper

= 30 × 45

= Rs. 1350

Let required rate is Rs. x per kg

$\therefore 12 \times 50 + 18 \times x = \frac{125}{100} \times 45 \times 30$

$\Rightarrow 18x = 1687.5 - 600$

$\Rightarrow x \simeq$ Rs. 60 per kg

Quantity 1 > Quantity 2

S123. Ans.(a)

Sol. Required percentage

$= \frac{\frac{30}{100} \times 3 + \frac{45}{100} \times 7}{10} \times 100$

= 40.5%

S124. Ans.(d)

Sol. Original price

$= 1360 \times \frac{100}{80} \times \frac{100}{85} = 2{,}000$

S125. Ans.(b)

Sol. 2S, 2E, P, C, I

Required ways $= \frac{5!}{2! \times 2!} \times 2! = 60$

Solutions (126-128):

Let total students doing B. tech in IIT Delhi be $100x$ and total students doing B. tech in IIT Mumbai be $120x$

Total students in CS stream in IIT Mumbai = $120x \times \frac{40}{100} = 48x$

Total students in Mechanical stream in IIT Mumbai = $120x \times \frac{20}{100} = 24x$

Total students in Electrical stream in IIT Mumbai

= $120x - (48x + 24) = 48x$

Total students in CS stream in IIT Delhi

= $48x \times \frac{100}{240} = 20x$

Total students in Mechanical stream in IIT Delhi
$= 24x \times 2 = 48x$
Total students in Electrical stream in Delhi IIT
$= 100x - (20x + 48x) = 32x$
Given $32x = 240$
$x = 7.5$
Total students doing B. TECH in IIT Delhi
$= 7.5 \times 100 = 750$
Total students doing B. tech in IIT Mumbai
$= 7.5 \times 120 = 900$

IIT Delhi		**IIT Mumbai**	
Stream	**Students**	**Stream**	**Students**
CS	150	CS	360
Mechanical	360	Mechanical	180
Electrical	240	Electrical	360

S126. Ans.(b)
Sol. Required percentage $= \frac{600-360}{600} \times 100$
$= \frac{240}{600} \times 100 = 40\%$

S127. Ans.(e)
Sol. Average number of students in CS stream in both IIT's
$= \frac{150+360}{2} = 255$
Average number of students in Electrical stream in both IIT's
$= \frac{240+360}{2} = 300$
Required difference = 300 – 255 = 45

S128. Ans.(c)
Sol. Required average $= \frac{750 + 900}{2}$
$= \frac{1650}{2} = 825$

S129. Ans.(e)
Sol. Total surface area of sphere = $4\pi r^2$
Total surface area of hemisphere = $3\pi r^2$
Let radius of hemisphere and sphere be $3x$ cm
And $2x$ cm respectively.
ATQ—
$3\pi r^3 - 4\pi r^2 = 423.5\ cm^2$
$3 \times \frac{22}{7} \times (3x)^2 - 4 \times \frac{22}{7} \times (2x)^2 = 423.5$
$x = 3.5$ cm
Radius of hemisphere $= \frac{21}{2}$ cm $= 10.5$

S130. Ans.(c)

Sol. Let initially wine was 3x

∴ Final quantity of wine

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

$= 3x \times \frac{16}{81}$

$= \frac{16x}{27}$

∴ Required ratio

$= \frac{\frac{16x}{27}}{3x-\frac{16x}{27}} = \frac{16}{65}$

S131. Ans.(a)

Sol.

$55 \times 48 - \frac{?}{100} \times 8000 = (12)^3 + 68 \times 4$

$\frac{?}{100} \times 8000 = 2640 - 1728 - 272$

$? = \frac{640 \times 100}{8000}$

$? = 8$

S132. Ans.(b)

Sol.

$\frac{352+?}{32} + \frac{125}{100} \times 64 - \sqrt{361} = (10)^2$

$\frac{352+?}{32} = 100 + 19 - 80$

$? = 1248 - 352$

$? = 896$

S133. Ans.(d)

Sol.

$\frac{4590}{?} + (25)^2 - \frac{37 \times 4800}{100} + 105 = (22)^2$

$\frac{4590}{?} + 625 - 1776 + 105 = 484$

$\frac{4590}{?} = (484 + 1776 - 730)$

$? = \frac{4590}{1530}$

$? = 3$

S134. Ans.(b)

Sol.

$44 \times 25 + 48 \times 15 + ? = \frac{32}{100} \times 6000$

1100 + 720 + ? = 1920

? = 1920 – 1820

? = 100

S135. Ans.(a)

Sol.

$\frac{?}{100} \times 700 + (21)^2 - \sqrt{3844} = (18)^3$

$\frac{?}{100} \times 700 + 441 - 62 = 5832$

$\frac{?}{100} \times 700 = 5832 - 441 + 62$

$? = \frac{5453}{7}$

? = 779

S136. Ans.(b)

Sol. From 1, one day work of one man in both cases will be equal.

$\therefore 40 \times 28 = \frac{3}{4} \times 28 \times (40 + x)$

$\Rightarrow x = 40 \times \frac{1}{3} = 13\frac{1}{3}$

$\simeq 14$

From 2,

Let present ages of Ria and Shweta be 4x and 7x respectively.

∴ Abby's present age = (7x + 4) years

ATQ,

4x +7x + 4 = 48 ⇒ x = 4

Shweta's present age = 7×4 = 28 years

Abby's present age= 28+4 = 32 years

∴ Abby's age two years ago = 32 -2 = 30 years

∴ Quantity 1 < Quantity 2

S137. Ans.(b)

Sol. From 1, Ajay's score = 63 + 30 = 93

Rahul's score = 93 – 15 = 78

Manish's score = 78 – 10 = 68

∴ Suresh's score = 63 × 3 – (68 + 78) = 43

∴ Required sum = 68 + 43 = 111

From 2, CP of Chandra= Rs 150

CP of Mayank $= 150 \times \frac{70}{100} = 105$

SP of Mayank $= \frac{120}{100} \times 105$ = Rs 126

S138. Ans.(a)

Sol. From 1, Let length of train B = x m

∴ length of train A = 2x m

Let speed of train B = s m/sec

And, speed of train A (in m/sec)

$= 90 \times \frac{5}{18} = 25$ m/sec

ATQ,

(25 – s) × 5 = (25 – 2s) ×15

⇒ 25 – s = 75 – 6s

⇒ s = 10 m/sec

∴ Length of train B

$= \frac{(25 - 10) \times 5}{3}$

= 25 m

From 2, Let Shilpa's present age = x years

Raghu's present age = y years

x + 4 + y – 4 = 63

x + y = 63 ...(i)

and, $\frac{x - 4}{y + 3} = \frac{10}{21}$

⇒ 21x – 84 = 10y + 30

⇒ 21x – 10y = 114 ...(ii)

Solving (i) and (ii), we get

x = 24 years

S139. Ans.(d)

Sol. Required ways $= \frac{6!}{2!} = 360$

S140. Ans.(c)

Sol. Let the fraction = $\frac{x}{y}$

After increasing numerator and denominator = $\frac{3.5x}{2.5y}$

∴ Required percentage

$= \frac{\frac{3.5x}{2.5y}}{\frac{x}{y}} \times 100 = 140\ \%$

S141. Ans.(b)

Sol. Required difference

$= \frac{25}{100} \times \frac{55}{100} \times 2{,}84{,}000 - \frac{18}{100} \times \frac{75}{100} \times 2{,}84{,}000$

= 39,050 – 38,340 = 710

S142. Ans.(c)

Sol. Required ratio $= \frac{42\times15}{18\times75} = \frac{7}{15}$

S143. Ans.(d)

Sol. Required average

$= \frac{1}{3}\left(\frac{25}{100}\times\frac{45}{100}+\frac{18}{100}\times\frac{25}{100}+\frac{5}{100}\times\frac{24}{100}\right)\times 2{,}84{,}000$

$= 2840\times\frac{1}{3}\left[\frac{45}{4}+\frac{18}{4}+\frac{12}{10}\right]$

$= 2840\times\frac{1}{3}\left[\frac{450+180+48}{40}\right]$

$= 284\times\frac{1}{3}\times\frac{678}{4} = 71\times 226 = 16046$

S144. Ans.(a)

Sol. No. of employees in Home ministry who do not have higher education

$= \frac{25}{100}\times\frac{55}{100}\times 2{,}84{,}000$

$= 39{,}050$

No. of employees in Defence Ministry who have higher education

$= \frac{42}{100}\times\frac{15}{100}\times 2{,}84{,}000$

$= 17{,}892$

∴ Required percentage

$= \frac{39{,}050-17{,}892}{17{,}892}\times 100 \simeq 118\%$

S145. Ans.(d)

Sol. Required total number

$= \left(\frac{42}{100}\times\frac{15}{100}+\frac{25}{100}\times\frac{18}{100}+\frac{10}{100}\times\frac{40}{100}\right)\times 2{,}84{,}000\times\frac{25}{100}$

$= \left(\frac{42}{100}\times\frac{15}{100}+\frac{25}{100}\times\frac{18}{100}+\frac{10}{100}\times\frac{40}{100}\right)\times 71000$

$[63+45+40]\times 71 = 148\times 71$

$= 10{,}508$

S146. Ans.(d)

Sol.

$(14+16+14+12)+\left(\frac{1}{11}+\frac{3}{11}+\frac{4}{121}+\frac{3}{11}\right) = ?$

$? = 56+\left(\frac{11+33+4+33}{121}\right)$

$= 56+\frac{81}{121}$

$= 56\frac{81}{121}$

S147. Ans.(e)

Sol. $49.5 + 987 - 48 = ?$

$? = 988.5$

S148. Ans.(c)

Sol. $10971 - 941 \times 3 = ?$

$? = 8148$

S149. Ans.(b)

Sol. $9 \times 25 \times \frac{63}{75} = ?$

$? = 189$

S150. Ans.(a)

Sol. $88 \times \sqrt{?} = 15224$

$\sqrt{?} = 173$

$? = 29929$

S151. Ans.(d)

Sol. Let quantity of A & B be 4x & x.

According to the question,

$$\frac{4x - 10 \times \frac{4}{5}}{x - 10 \times \frac{1}{5} + 10} = \frac{2}{3}$$

$$\Rightarrow \frac{4x - 8}{x + 8} = \frac{2}{3}$$

$\Rightarrow 12x - 24 = 2x + 16$

$\Rightarrow 10x = 40$

$x = 4$

$\therefore$ Required answer = $4x = 4 \times 4 = 16$ litres

S152. Ans.(c)

Sol. Let initially x litres of Acid were drawn off

$$\therefore 24 = 54\left(1 - \frac{x}{54}\right)^2$$

$\Rightarrow 24 \times 54 = (54 - x)^2$

$\Rightarrow x^2 - 108x + 1620 = 0$

$\Rightarrow x^2 - 90x - 18x + 1620 = 0$

$\Rightarrow (x - 90)(x - 18) = 0$

× ✓

$\therefore x = 18$ litres

S153. Ans.(d)

Sol. After 1st day, remaining content in container = 2/3

After 2nd day, remaining content in container

$= \frac{2}{3} - \frac{3}{4} \times \frac{2}{3}$

$= \frac{1}{6}$

S154. Ans.(a)

Sol. From 1, Let each sum was Rs. P

$\therefore \frac{P \times 9 \times 7}{200} - \frac{P \times 4 \times 7}{100} = 31.5$

$\Rightarrow P = \frac{31.5 \times 200}{7}$

$\Rightarrow$ P = 900 rupees

From 2, Total required numbers between 2000 and 3000

$= 1 \times 7 \times 6 \times 5$ (For eg. 2035, 2345)

= 210

Quantity 1> Quantity 2

S155. Ans.(b)

Sol. From 1, Let the maximum marks of the exam be x

ATQ,

$\frac{20}{100}x + 30 = \frac{50}{100} \times x - 15$

$\Rightarrow \frac{50}{100}x - \frac{20}{100}x = 45$

$\Rightarrow \frac{30}{100}x = 45$

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

Passing marks = $\frac{150}{100} \times 20 + 30 = 60$

From 2, Let the initial price of mobile be Rs. 100

Final price of mobile = $100 \times \frac{140}{100} \times \frac{80}{100} \times \frac{150}{100} = Rs.168$

So net change in price = $\frac{168 - 100}{100} \times 100 = 68\%$

Quantity 1< Quantity 2

Solutions (156-160):

	Monday	Tuesday	Wednesday	Thursday	Friday
Tata	180	150	250	150	180
Renault	160	220	200	180	140
Maruti	200	200	300	250	200
	540	570	750	580	520

S156. Ans.(b)
Sol.
$\frac{540}{750} = 18 : 25$

S157. Ans.(a)
Sol. Total number of cars produced by Renault from Monday to Friday = 900

S158. Ans.(c)
Sol. Required average $= \frac{1150}{5} = 230$

S159. Ans.(c)
Sol. No. of cars produced on Tuesday and Thursday is same i.e. 150

S160. Ans.(b)
Sol. Maximum number of cars produced = 750, on Wednesday.

S161. Ans.(a)
Sol. I. $x^2 + 12x + 36 = 0$
$x^2 + 6x + 6x + 36 = 0$
$x(x + 6) + 6 (x + 6) = 0$
$x = -6$ or -6
II. $y^2 = 16$
$y \pm 4$
$y > x$

S162. Ans.(e)
Sol. I. $9x^2 + 3x - 2 = 0$
$9x^2 + 6x - 3x - 2 = 0$
$3x (3x + 2) - 1 (3x + 2) = 0$
$x = \frac{-2}{3}$ or $\frac{1}{3}$
II. $8y^2 + 6y + 1 = 0$
$8y^2 + 4y + 2y + 1 = 0$
$4y (2y + 1) + 1 (2y + 1) = 0$
$y = \frac{-1}{4}$ or $\frac{-1}{2}$
No relation

S163. Ans.(d)
Sol. I. $2x^2 - 25x + 77 = 0$
$2x^2 - 14x - 11x + 77 = 0$
$2x (x - 7) - 11 (x - 7) = 0$
$x = 7$ or $\frac{11}{2}$

II. $2y^2 - 21y + 55 = 0$
$2y^2 - 10y - 11y + 55 = 0$
$2y(y - 5) - 11(y - 5) = 0$
$y = \frac{11}{2}$ or 5
$x \geq y$

S164. Ans.(e)
Sol. I. $2x^2 + 9x + 7 = 0$
$2x^2 + 7x + 2x + 7 = 0$
$X(2x + 7) + 1(2x + 7) = 0$
$x = -1$ or $\frac{-7}{2}$
II. $2y^2 + 9y + 10 = 0$
$2y^2 + 5y + 4y + 10 = 0$
$Y(2y + 5) + 2(2y + 5) = 0$
$y = -2$ or $\frac{-5}{2}$
No relation

S165. Ans.(e)
Sol. I. $9x^2 - 33x + 28 = 0$
$9x^2 - 12x - 21x + 28 = 0$
$3x(3x - 4) - 7(3x - 4) = 0$
$x = \frac{4}{3}$ or $\frac{7}{3}$
II. $6y^2 - 25y + 25 = 0$
$6y^2 - 15y - 10y + 25 = 0$
$3y(2y - 5) - 5(2y - 5) = 0$
$y = \frac{5}{2}$ or $\frac{5}{3}$
∴ No relation

S166. Ans.(b)
Sol. Required percentage
$$= \frac{45 \times \frac{5}{9} + 72 \times \frac{3}{8}}{54 \times \frac{2}{3} + 60 \times \frac{3}{5}} \times 100$$
$$= \frac{25 + 27}{36 + 36} \times 100 = 72.22\%$$

S167. Ans.(c)
Sol. Required difference
$$= \left(36 \times \frac{5}{12} + 45 \times \frac{4}{9}\right) - \left(72 \times \frac{3}{8} + 60 \times \frac{2}{5}\right)$$
$= (27+24) - (15+20) = 51 - 35 = 16$

S168. Ans.(e)

Sol. New total students in institute D = $60+ 72\times \frac{5}{8}\times \frac{1}{3} = 75$

Remaining students in institute C = $72-15 = 57$

Required ratio = $\frac{57}{75} = 19 : 25$

S169. Ans.(c)

Sol. Boys in institute Z = $45 \times \frac{4}{9}\times \frac{120}{100} = 24$

Total students in institute Z = $72 \times \frac{7}{8} = 63$

Girls in institute Z = $63-24 = 39$

Required percentage = $\frac{39}{63}\times 100 = 61\frac{19}{21}\%$

S170. Ans.(a)

Sol. Required average = $\frac{1}{3}\left(54 \times \frac{1}{3} + 72 \times \frac{3}{8} + 60 \times \frac{2}{5}\right) = 23$

S171. Ans.(b)

Sol. If first digit is '3' then remaining numbers can be formed in 9^4 ways = 6561 ways

If first digit isn't '3' then first digit can be formed in 8 ways (excluding 3 and 0). Now out of remaining four one should be '3' and remaining three digits can be formed in 9^3 ways = 729 ways

So, total ways to form five digit number in which first digit isn't '3'

= 4 × 8 × 729 = 23,328

'4' is multiplied because the digit '3' can take four places.

And, Total ways to form five digit numbers in which first digit is '3'

= 6561 ways

Total number of ways = 23,328 + 6561 = 29,889

S172. Ans.(a)

Sol. To get a tail, two diamonds should occur.

No. of ways = $^{13}C_2 = 13 \times 12 \times \frac{1}{2} = 78$

S173. Ans.(a)

Sol. When unit digit is '0'

Number of ways=$6 \times 5 \times 1 = 30$

When unit digit is '5'

Number of ways=$5 \times 5 \times 1 = 25$

Total number of ways=30+25=55

S174. Ans.(d)

Sol. No. of triangles formed = $^{12}C_3 - {}^{8}C_3$

= 220 – 56 = 164

S175. Ans.(d)

Sol. v c v c v c v c v c v

No of consonants = 5

No of vowel = 4

5 consonants in 5 ways = 5!

4 vowels in 4 way = 4!× $6C_4$

Total arrangement = 15 ×4! × 5!

S176. Ans.(a)

Sol. $\frac{35}{100} \times 3500 + \frac{25}{100} \times 2600 - 1260 \simeq ?$

? = 1225 + 650 – 1260

? = 615

S177. Ans.(e)

Sol. 2396 + 260 × 5 – 450 – ? ≃ 590

? ≃ 2396 + 1300 – 450 – 590

? ≃ 2656

S178. Ans.(d)

Sol.

$$\frac{55}{100} \times 2000 + ? \times \frac{5000}{100} \simeq 1825$$

55 × 20 + ? × 50 ≃ 1825

$$? \simeq \frac{1825 - 1100}{50}$$

? ≃ 14.5

S179. Ans.(a)

Sol. $(15 \times 20) + (5^2 \times 13) \approx (?)^2$

$300 + 325 \approx (?)^2$

$?^2 \approx 625$

? ≈ 25

S180. Ans.(d)

Sol. $2524 \div \sqrt{16} - 331 \approx (5)^2 \times ?$

$2524 \times \frac{1}{4} - 331 \approx 25 \times ?$

631 – 331 ≈ 25 × ?

$? = 300 \times \frac{1}{25}$

? = 12

S181. Ans.(e)

Sol. I. $\sqrt{x+18} = \sqrt{144} - \sqrt{49}$

$\Rightarrow \sqrt{x+18} = 5$

$\Rightarrow x + 18 = 25$

$\Rightarrow x = 7$

II. $y^2 + 409 = 473$

$\Rightarrow y^2 = 64$

$\Rightarrow y = \pm 8$

No relation between x and y.

S182. Ans.(a)

Sol. I. $y^2 - x^2 = 32$

$\Rightarrow (x+2)^2 - x^2 = 32$

$\Rightarrow x^2 + 4 + 4x - x^2 = 32$

$\Rightarrow 4x = 28$

$\Rightarrow x = 7$

II. y – x = 2

$\Rightarrow y - 7 = 2$

$\Rightarrow y = 9$

$\therefore x < y$

S183. Ans.(d)

Sol. I. $x^2 - 7x + 2x - 14 = 0$

$x(x-7) + 2(x-7) = 0$

$x = 7, -2$

II. $y^2 + 5y + 2y + 10 = 0$

$y = -2, -5$

$x \geq y$

S184. Ans.(a)

Sol. I. $8x^2 + 78x + 169 = 0$

$\Rightarrow 8x^2 + 52x + 26x + 169 = 0$

$\Rightarrow 4x(2x+13) + 13(2x+13) = 0$

$\Rightarrow (4x+13)(2x+13) = 0$

$\Rightarrow x = -\frac{13}{4}, -\frac{13}{2}$

II. $20y^2 - 117y + 169 = 0$

$\Rightarrow 20y^2 - 65y - 52y + 169 = 0$

$\Rightarrow 5y(4y-13) - 13(4y-13) = 0$

$\Rightarrow (5y-13)(4y-13) = 0$

$\Rightarrow y = \frac{13}{5}, y = \frac{13}{4}$

$\therefore x < y$

S185. Ans.(b)

Sol. I. $5x^2 + 5x - 3x - 3 = 0$

$5x(x + 1) - 3(x + 1) = 0$

$x = \frac{3}{5}, -1$

II. $2y^2 + 4y + 3y + 6 = 0$

$2y(y + 2) + 3(y + 2) = 0$

$y = \frac{-3}{2}, -2$

$x > y$

S186. Ans.(b)

Sol.

Quantity 1: let the work is 36

X, Y and Z can complete 3units, 2units and 4 units per days respectively.

3 days work = 3 + 3 + 3 + 2 + 4 = 15

6 day's work = 15 × 2 = 30

5 day's work = 30 + 3 + 3 = 36

Total work is completed is 8 days

x = 8 days

Quantity II: Let remaining work is completed by A in 'a' days.

ATQ,

$\frac{a+2+4}{20} + \frac{2}{12} + \frac{6}{15} = 1$

$\frac{3(a+6)+5\times2+4\times6}{60} = 1$

3a + 18 + 10 + 24 = 60

$a = \frac{8}{3}$ days

$y = \frac{8}{3} + 2 + 4$

$y = 8\frac{2}{3}$ days

$y > x$

Quantity II > Quantity I

S187. Ans.(c)

Sol. Quantity I. (5C2 * 4C2)/12C4 = 60/495=4/33

Quantity II. (5C2 * 4C1 *3C1)/12C4 =120/495=8/33

Quantity II > Quantity I

S188. Ans.(e)

Sol. C.P. of article

$= 5700 \times \frac{100}{60} = \text{Rs. } 9500$

S.P. of article to gain 30% profit

$= 9500 \times \frac{130}{100} = \text{Rs. } 12{,}350$

S189. Ans.(b)

Sol. Let radius of circle A be r cm

ATQ

$2\pi r - 2r = 90$

$r = 21\ cm$

Radius of circle B=14 cm

Area of circle B= 616 cm^2

S190. Ans.(a)

Sol. Ratio of investment of Rita and Gita

= 24000 : 40000

= 3 : 5

∴ Profit of Rita

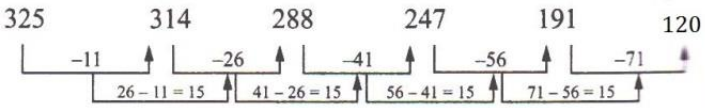
$= \frac{1}{2} \times \frac{40}{100} \times 16800 + \frac{3}{8} \times \frac{60}{100} \times 16800$

= 3360 + 3780

= Rs. 7,140

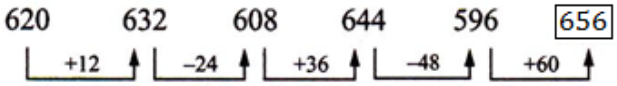
S191. Ans.(d)

Sol.



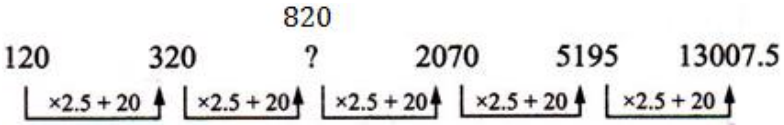
S192. Ans.(c)

Sol.



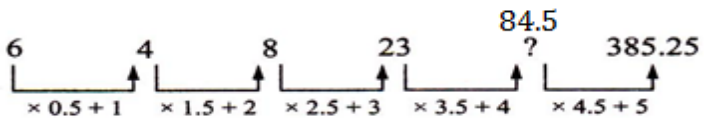
S193. Ans.(e)

Sol.



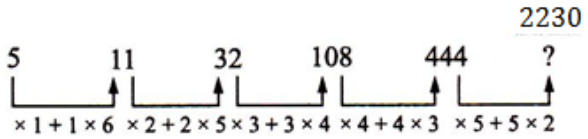
S194. Ans.(a)

Sol.



So, the answer is 84.5

S195. Ans.(b)
Sol.



So, the answer is 2230.

S196. Ans.(c)
Sol.

$$\frac{24 \times 13 \times 32}{224 \times 16 \times 52} = \frac{36 \times 18 \times x}{432 \times 21 \times 64} \quad (x = \text{no. of days})$$

$$\frac{1}{224} = \frac{9x}{432 \times 7 \times 32}$$

$\frac{1}{7} = \frac{x}{48 \times 7} \Rightarrow x = 48$ days

Concept —

$$\frac{m_1 \times d_1 \times h_1}{w_1} = \frac{m_2 \times d_2 \times h_2}{w_2}$$

S197. Ans.(a)
Sol. Let 25 paise coins = x
∴ Rs. 1 coins = 3x
∴ 50 paise coins = (220 – 4x)
ATQ,

$$3x + \frac{x}{4} + \frac{(220 - 4x)}{2} = 160$$

$\Rightarrow 12x + x + 440 - 8x = 160 \times 4 \Rightarrow x = 40$
∴ 50 paise coins = 220 – 160 = 60

S198. Ans.(b)
Sol. Let A = Anup's age
M = Mahesh's age
S = Shyam's age

$$\frac{S - 6}{18} = A$$

Also, A = 3 years (∵ M = 5 years)
∴ S = 3 × 18 + 6 = 60 years

S199. Ans.(b)
Sol. Let father's age = F, Son's age = y
3F = 8y
$\Rightarrow 3F - 8y = 0$.....(i)
$\Rightarrow (F + 8) = 2(y + 8)$
$\Rightarrow F - 2y = 8$ .....(ii)
From (i) – (ii) × 3
y = son's age = 12 years
And F = father's age = 32 years.

S200. Ans.(c)

Sol. Ratio of time taken by A & B = 3 : 2

If $3x$ & $2x$ be the time taken by them, then

$3x - 2x = 10$

or, $x = 10$

⇒ A takes 30 minutes at normal speed.

At double its speed, it will cover the distance in $\frac{30}{2} = 15$ minutes.

S201. Ans.(d)

Sol. Let Rohan's age = x

∴ Rahul's age = (x +8) years

ATQ,

x + 8 + 5 = 2(x+ 5)

⇒ x = 3 years

∴ Rohan's age after 20 years = 23 years

S202. Ans.(d)

Sol. Total expenditure of Neha $= \frac{100}{65} \times 7800 = \text{Rs } 12000$

∴ Total annual salary $= \frac{11}{6} \times 12000 \times 12 = \text{Rs } 2{,}64{,}000$

S203. Ans.(c)

Sol. Total expenditure of Reena $= \frac{100}{42} \times 4200 = \text{Rs } 10{,}000$

∴ Savings of Reena = 22000 – 10000 = Rs 12,000

Total expenditure of Shaalu $= \frac{100}{60} \times 7200 = \text{Rs } 12000$

∴ Savings of Shaalu $= 26000 - 12000 = \text{Rs } 14000$

So, required difference = Rs 2000

S204. Ans.(b)

Sol. Expenditure of Seema on rent $= \frac{22}{100} \times \frac{9}{14} \times 28000 = \text{Rs } 3960$

Expenditure of Shaalu on food $= \frac{25}{60} \times 7200 = \text{Rs } 3000$

∴ Required percentage $= \frac{3960}{3000} \times 100 = 132\%$

S205. Ans.(e)

Sol. Savings of Seema$= \frac{5}{14} \times 28000 = \text{Rs } 10000$

Savings of Aarti $= \frac{8}{9} \times 18000 = \text{Rs } 16000$

∴ Required percentage $= \frac{6000}{16000} \times 100 = 37.5\%$

S206. Ans.(b)

Sol. The series is $4^3 + 4, 5^3 - 5, 6^3 + 6, 7^3 - 7, 8^3 + 8, 9^3 - 9, \ldots$

i.e.

$4^3 + 4 = 68$,

$5^3 - 5 = \mathbf{120}$,

$6^3 + 6 = 222$,

$7^3 - 7 = 336$,

$8^3 + 8 = 520$,

$9^3 - 9 = 720$.

Hence there should be 120 in place of **130**.

S207. Ans.(d)

Sol. The series is ×1.5+5, ×1.5+5, (repeated)

i.e.

56 × 1.5 + 5 = 89,

89 × 1.5 + 5= **138.5**,

138.5 × 1.5 + 5 = 212.75,

212.75 × 1.5 +5 = 324.125,

324.125 × 1.5 + 5 = 491.1875,

Hence there should 138.5 in place of 136.5.

S208. Ans.(a)

Sol. The series is +29, +58, +87, +116, +145,...

i.e.

87 + 29 = 116,

116 + 58 = 174,

174 + 87 = 261,

261 + 116 = **377**,

377 + 145 = 522,

Hence there should be 377 in place of 397.

S209. Ans.(b)

Sol. The series is

$26^2 - 6 = 670$,

$27^2 + 7 = 736$,

$28^2 - 8 = 776$,

$29^2 + 9 = 850$,

$30^2 - 10 = 890$,

$31^2 + 11 = 972, \ldots$

Hence these should be 776 in place of 792.

S210. Ans.(a)

Sol. The series is

$273 - 5^2 = \mathbf{248}$,

$248 + 5^3 = 373$,

$373 - 6^2 = 337$,

$337 + 6^3 = 553$,

$553 - 7^2 = 504$,...

Hence there should be 248 in place of **249**.

S211. Ans.(e)

Sol. From (I)

R = 6%

From (II) & (III),

SI for 2 years = 1200

Principal = 10 × 1200 = 12000

$\therefore$ Amount $= P\left(1 + \frac{R}{100}\right)^t$

So, Statement II and either I or III are sufficient.

S212. Ans.(d)

Sol. From A,

$r = \frac{3\ell}{5}$, ℓ =slant height of cone

From B,

Volume of cone $= \frac{1}{3}\pi r_1^2 h = 432\ \text{cm}^3$

From C,

$r_1 = \frac{3}{4}a$ a = side of square (unknown)

Unknown

h = unknown

$\therefore$ Answer cannot be found

S213. Ans.(d)

Sol. Let CP of scooter = Rs x

From A, MP of scooter = SP of bike

From B, SP of scooter $= 115x/100$

From C, SP of bike $= \frac{5}{3} \times \frac{115x}{100}$

Since, SP of bike is not known. So, answer cannot be found

S214. Ans.(d)

Sol. Let largest no. = Z

Middle No. = Y

Smallest No. = X

From A, $Z = X + 12$

B, $X + Z = 2Y$

C, Here, we don't know the sequence of odd numbers i.e. whether it is in increasing order or in decreasing order.

∴ From all statements, we can't determine the average value

S215. Ans.(b)

Sol. Let speed of stream be x km/hr.

Speed of boat in still water be y km/hr.

From (I),

$x = \frac{2}{3}y$

From (II),

$x + y = \frac{20}{2} = 10\ \text{km/hr}$

From (III),

$y - x = \frac{10}{5} = 2\ \text{km/hr}$

So, Any two are sufficient

S216. Ans.(d)

Sol. Required no. of boys in schools C and F

$= \left(2000 - \frac{2000 \times 27.5}{100}\right) + \left(1000 - \frac{1000 \times 17.5}{100}\right)$

$= 1450 + 825 = 2275$

∴ Required percentage $= \frac{2275}{3000} \times 100 = 75.83\%$

S217. Ans.(c)

Sol. Total no. of boys in school E

$= 1250 - 1250 \times \frac{40}{100}$

$= 1250 - 500 = 750$

S218. Ans.(a)

Sol. Required percentage $= \frac{2000}{2250} \times 100 = 88.88 \simeq 89\%$

S219. Ans.(b)

Sol. Required average no.

$$= \frac{\left(2500 - 2500 \times \frac{40}{100}\right) + \left(3000 - 3000 \times \frac{45}{100}\right)}{2}$$

$$= \frac{1500 + 1650}{2}$$

$$= \frac{3150}{2}$$

$$= 1575$$

S220. Ans.(c)

Sol. Required ratio

$$= \frac{2500 \times \frac{40}{100}}{3000 \times \frac{45}{100}} = \frac{25 \times 4}{3 \times 45} = 20 : 27$$

S221. Ans.(c)

Sol. ? = 6894

S222. Ans.(b)

Sol. ? = 81.25+2.1

= 83.35

S223. Ans.(a)

Sol. 350 × ?/100 × 1/50 = 343

? = 4900

S224. Ans.(a)

Sol. 1/2 × 3842 + 15/100 × ? = 2449

? = (528×100)/15

? = 3520

S225. Ans.(d)

Sol. ? = 448.8/24

? = 18.7