Quiz – 1

S1. Ans.(b)
Sol.
Let speed of bus and car be 6x km/hr and 7x km/hr respectively
So,
(7x – 6x) × 4 = 28
x = 7
Required time = $\frac{196}{7\times7}$ = 4 hours

S2. Ans.(e)
Sol.
One day work of Veer = $\frac{1}{x}$
3 day work of Veer = $\frac{3}{x}$
One day work of Sameer = $\frac{1}{(x+4)}$
4 day work of Sameer = $\frac{4}{x+4}$
ATQ,
$\frac{\frac{3}{x}}{\frac{4}{(x+4)}} = \frac{15}{16}$
(3x + 12) 16 = 60x
48x + 192 = 60x
x = 16

S3. Ans.(c)
Sol.
Let length of train A = length of train B = ℓ m
ATQ,
$\Rightarrow \frac{\ell+98}{24} = \frac{\ell}{12} \times \frac{120}{100}$
ℓ = 70 m

S4. Ans.(a)
Sol.
Let speed of boat in still water = $11x$
Speed of stream = x
Now ATQ,
$\frac{220}{(11x-x)} - \frac{220}{11x} = 1$
$\frac{220}{10x} - \frac{220}{11x} = 1$
$\frac{1}{x}(22-20) = 1$
$x = 2$

So speed of boat in still water = 11 × 2 = 22 km/hr

S5. Ans.(b)

Sol. Let capacity of tank = 180 lit (L.C.M of 12,10, and 18)
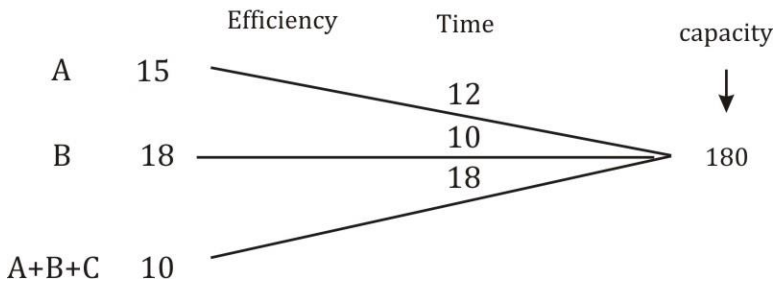
Efficiency of C (leak) = 10 – 15 – 18 = –23 lit/h.

-ve sign indicate that water is leaking.

23 lit/h units = $\frac{23}{60}$ lit/min units = 46 lit/min.

180 units = $\frac{46 \times 60\ 180}{23}$ = 21600 lit

S6. Ans(a)

Sol. let total work = 96 units (multiple of 16)

Let efficiency of Hemant = $4x$ units/day

Then, efficiency of Manoj and Vikash = 3x units/day and 2x units/day respectively

ATQ

$4x + 2x = \frac{96}{16}$

$6x = 6$

$x = 1$

Required time = $\frac{96}{3 \times 1 \times \frac{150}{100}} = 21\frac{1}{3} days.$

S7. Ans(b)

Sol. let speed of trains – A & B are x m/s and y m/s respectively.

ATQ

$5x + 5y = 850$

$x + y = 170$ ……. (i)

And

$x - y = \frac{850}{\frac{85}{3}}$

$x - y = 30$ …….. (ii)

From (i) and (ii)

$x = 100\ m/s$ and $y = 70\ m/s$

Required ratio = $\frac{5 \times 100}{5 \times 70}$ = 10: 7

S8. Ans.(e)

Sol. Time taken by train to cross a pole $= \frac{1}{1200} \times 60 \times 60 = 3$ sec.

When speed is constant then ratio of time taken is directly proportional to Distance covered

So, Ratio of length of train to length of (train + tunnel)

$\Rightarrow 3 : 10$

Let length of train $= 3x$

Length of tunnel $= 10x - 3x = 7x$

ATQ,

$7x - 3x = 200$

$4x = 200$

So, $3x = 150$ meter

Speed of train $= \frac{150}{3} = 50$ m/sec.

S9. Ans (b)

Sol. Let total work be 60 units

So, efficiency of A = 4 units/day

And efficiency of B = 3 units/day

Let efficiency of C = x units/day

ATQ

$(4 + 3 + x) \times 6 = 60$

$x = 3$ units/day

ratio of efficiency of A :B :C = 4 :3 :3

C's share in wage $= \frac{3}{10} \times 5400 = Rs\ 1620$

S10. Ans (c)

Sol. Let total capacity of the tank be 60 units (LCM of 15, 60, 10)

Now, efficiency of the First, second and third pipe be 4 units/min, 1 units/min and 6 units/min respectively.

Tank filled in first 10 min $= (4 + 1) \times 10 = 50\ units$

Now, when all the pipe work together, 1 unit of water will out in every minute from tank.

So, 50 units of water will be emptied in 50 min.

S11. Ans (d)

Sol. Let the length of train be L meter.

ATQ

$25 = \frac{5L + L}{90 \times \frac{5}{18}} - \frac{L}{90 \times \frac{5}{18}}$

$25 = \frac{6L}{25} - \frac{L}{25}$

$5L = 625$

$L = \frac{625}{5} = 125\ m$

S12.Ans (c)

Sol.

Downstream speed of boat = $11.2 \times \frac{60}{48} = 14$ km/hr

Speed of boat = $14 \times \frac{3}{4} = 10.5$ km/hr

Speed of current = $14 \times \frac{1}{4} = 3.5$ km/hr

Required time = $\frac{42}{(10.5+3.5)} + \frac{42}{(10.5-3.5)}$

= 3 + 6

= 9 hours

S13. Ans (a)

Sol. Let the total capacity of the cistern is 24 units. (LCM)

So, the efficiency of the pipe A and pipe B are 2 units/ hour and 3 units/hour respectively.

ATQ

Total time taken to fill the cistern = $\frac{24}{2+3} + \frac{12}{60} = 5$ $hour$

Efficiency of leakage = $(2 + 3) - \frac{24}{5} units/hour$

$= \frac{1}{5}$ units/hour

∴ time taken by leakage to empty the full tank alone = $\frac{24}{\frac{1}{5}} = 120$ $hours$

S14. Ans (c)

Sol. Let speed of the boat in still water and speed of the current be x km/hr and y km/hr respectively.

ATQ

$\frac{30}{x-y} + \frac{45}{x+y} = 13$ ……… (i)

$\frac{24}{x-y} + \frac{30}{x+y} = 10$ ……… (ii)

By equating (i) and (ii)

$\frac{300}{x-y} + \frac{450}{x+y} = \frac{312}{x-y} + \frac{390}{x+y}$

$\frac{60}{x+y} = \frac{12}{x-y}$

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

Let x = 3a and y = 2a

Now, $\frac{30}{3a-2a} + \frac{45}{3a+2a} = 13$

$\frac{30}{a} + \frac{45}{5a} = 13$

$a = 3$

∴ speed of the current = 6 km/hr

S15. Ans (d)

Sol. Let total work be 60 units (LCM)

So, efficiency of Raghav and Dev be 4 units/day and 3 units/day respectively.

4-day work of Raghav and Dev =$(4 +3)\times 4 = 28$ $units$

Remaining work = $60 - 28 = 32$ $units$

So, fraction of work left = $\frac{32}{60} = \frac{8}{15}$

S1. Ans.(b)

Sol.

Word are = (3-I, 2-N, 1-T, 2-C, 1-O)

Required no. of ways = $\frac{8!}{3! \times 2! \times 2!}$ = 1680

S2. Ans.(e)

Sol.

Total two digits number = 90

Multiple of 3 = {12,15,18, … … 99} = 30

Multiple of 12 = {12,24,36, … … 96}= 8

Favorable events = 30 – 8 = 22

Required probability = $\frac{22}{90} = \frac{11}{45}$

S3. Ans.(a)

Sol. Let length and breadth of rectangular field = 4x and 9x respectively

ATQ,

2 × (4x + 9x) × 4 = 208

x = 2

Area of are rectangular field = 4 × 2 ×9 × 2 = $144 m^2$.

S4. Ans(a)

Sol. required probability = $\frac{13}{52} \times \frac{12}{51} + \frac{4}{52} \times \frac{3}{51}$

$= \frac{156+12}{52 \times 51}$

$= \frac{14}{221}$

S5. Ans(c)

Sol. circumference of circle of radius 'r' = $2\pi r = 22\sqrt{2} \times \sqrt{2}$

$\Rightarrow 2\pi r = 22 \times 2$

$r = 7\ cm$

Area of circle $(\pi r^2) = \frac{22}{7} \times 7 \times 7$

$= 154\ cm^2$

S6. Ans.(d)

Sol.

Let the length be 5x cm

And breadth = 4x cm

ATQ,

$5x \times 4x - (5x + 3)\left(4x \times \frac{5}{8}\right) = 150$

$\Rightarrow 20x^2 - (5x + 3) \times \frac{5x}{2} = 150$

$\Rightarrow 20x^2 - \frac{25x^2}{2} - \frac{15x}{2} = 150$

$\Rightarrow 15x^2 - 15x = 300$

$\Rightarrow x^2 - x - 20 = 0$

$\Rightarrow x^2 - 5x + 4x - 20 = 0$

$\Rightarrow x(x - 5) + 4(x - 5) = 0$

$\Rightarrow x = 5$

Required perimeter = $2(5x + 4x) = 2 \times 9 \times 5 = 90$ cm

S7. Ans.(d)

Sol. Minimum amount will be when all coins are one-rupee coin

Required probability $= \frac{^7C_3}{^{22}C_3} = \frac{7 \times 6 \times 5}{22 \times 21 \times 20} = \frac{1}{44}$

S8. Ans.(c)

Sol. Let length & breadth of Rectangular park are 'a' meter and 'b' meter respectively.

ATQ,

$a^2 + b^2 = (26)^2$

$a^2 + b^2 = 676 \ldots$ (i)

and $2(a + b) = 68$

$a + b = 34$

$a^2 + b^2 + 2ab = 1156 \ldots$ (ii)

using (i) in (ii)

$2ab = 1156 - 676$

$2ab = 480$

Area of park (ab) $= \frac{480}{2} = 240\text{m}^2$

S9. Ans (a)

Sol. Total outcomes (N) $= 6^3 = 216$

The favorable conditions= (6, 5, 6), (6, 6, 5), (5, 6, 6) = 3

Required probability $= \frac{3}{216} = \frac{1}{72}$

S10. Ans.(d)

Sol.

Let length of rectangle = 3x unit

Then, breadth of rectangle = x unit

Atq,

$\frac{3x \times x}{2 \times (3x + x)} = \frac{9}{2}$

$\frac{3x^2}{8x} = \frac{9}{2}$

$6x^2 = 72x$

$x = 12$

area of rectangle $= 3x^2$

$= 3 \times 144$

$= 432\text{unit}^2$

S11. Ans.(c)
Sol.

Boys in school - A & E together $= \frac{720}{9} \times 11 + 350 \times \frac{8}{7}$

= 880 + 400

= 1280

Boys in school - B & C together $= 540 \times \frac{3}{2} + 270 \times \frac{7}{3}$

= 810 + 630

= 1440

Required ratio $= \frac{1280}{1440}$

$= \frac{8}{9} = 8 : 9$

S12. Ans.(e)
Sol.

Average number of girls in school - B, C & D $= \frac{540+270+576}{3}$

= 462

Average number of students in school - A & D $= \frac{1}{2}\left[720 \times \frac{20}{9} + 576 \times \frac{25}{12}\right]$

$= \frac{1}{2}[1600 + 1200]$

= 1400

Required % $= \frac{462}{1400} \times 100$

= 33%

S13. Ans.(d)
Sol.

Students in school – B $= 540 \times \frac{5}{2}$

= 1350

Girls in school – E and boys in school – D together $= 350 + 576 \times \frac{13}{12}$

= 350+ 624 = 974

Required difference = 1350 – 974 = 376

S14. Ans.(d)
Sol.

Students in school – C & E together $= \left[270 \times \frac{10}{3} + 350 \times \frac{15}{7}\right]$

= 900+ 750

= 1650

Required % $= \frac{1650-720}{720} \times 100$

$= \frac{930}{720} \times 100$

$= \frac{775}{6}\%$

$= 129\frac{1}{6}\%$

S15. Ans.(a)
Sol.
Girls in school – A & D together = 720 + 576 = 1296
Boys in school – A & E together = $720 \times \frac{11}{9} + 350 \times \frac{8}{7}$
= 880+ 400
=1280
Required % $= \frac{1296}{1280} \times 100$
$= \frac{405}{4} \%$
$= 101\frac{1}{4}\%$

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Quiz – 3

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S1. Ans.(b)
Sol.
$\frac{?}{4} \times \frac{3}{5} \times \frac{24}{25} \times 625 = 3125 \times 54$
$\Rightarrow ? = \frac{3125 \times 54}{90}$
$\Rightarrow ? = 1875$

S2. Ans.(a)
Sol.
? = 13456 – 11342
$\Rightarrow$?= 2114

S3. Ans.(d)
Sol.
$4^? \times (4^5) = 4^4 \times 4^5$
$\Rightarrow 4^? = 4^4$
$\Rightarrow ? = 4$

S4. Ans.(e)
Sol.
? = 396 + 224 – 64
$\Rightarrow$?= 556

S5. Ans.(d)
Sol.
? = 32 + 28 – 9
? = 51

S6. Ans.(c)
Sol.
$\frac{56 \times 55}{100} + \frac{?}{100} \times 132.8 = 64$
$30.8 + \frac{?}{100} \times 132.8 = 64$
$? = \frac{33.2 \times 100}{132.8}$
? = 25

S7. Ans.(d)
Sol.
280 + ? = 784 – 24
? = 760 – 280
? = 480

S8. Ans.(d)
Sol.
$\frac{?}{32.5} + 1024 + \frac{80}{100} \times 317.5 = 1296$
$\frac{?}{32.5} = 1296 – 1024 – 254$
$\frac{?}{32.5} = 18$
?= 585

S9. Ans.(a)
Sol.
94.5 + 98 + ? = 196
? = 196 – 192.5
? = 3.5

S10. Ans.(b)
Sol.
$\frac{41}{100} \times 2560 + \frac{32}{100} \times 388.75 = 1156 + ?$
1049.6 + 124.4 – 1156 = ?
? = 1174 – 1156
? = 18

S11. Ans.(a)
Sol.
144 + 256 + 90 = $?^2$ + 6
490 = $?^2$ + 6
$?^2$ = 484
? = 22

S12. Ans.(b)
Sol.
$(3 + 5 – 2) + \frac{2+1-2}{14}$
$= 6\frac{1}{14}$

S13. Ans.(e)
Sol.
$\frac{?}{100} \times 37.5 + 175 = \frac{25}{100} \times 760$
$\frac{?}{100} \times 37.5 = 190 – 175$
$? = \frac{1500}{37.5}$
? = 40

S14. Ans.(c)
Sol.
2813 – ? = 484 + 10
? = 2813 – 494
? = 2319

S15. Ans.(a)
Sol.
$\frac{783}{?} = 190 + 29.25 - 175.75$
$? = \frac{783}{43.5}$
? = 18

Quiz – 4

S1. Ans. (a)
Sol. Let efficiency of B be 5x units/day
So, efficiency of A = $\frac{80}{100} \times 5x$
= 4x units/day
And, efficiency of C = $\frac{120}{100} \times 5x$
= 6x units/day
Total work = $(5x \times 12)$
= 60x units
1 day wage of A, B & C together = $\frac{15x}{60x} \times 600$
= Rs.150
Required difference = $150 \times 4 \times \frac{6x-4x}{15x}$
= Rs.80

S2. Ans. (d)
Sol. ATQ,
$\frac{\left(100-20-X\times\frac{100-20}{100}\right)}{\left(20-X\times\frac{20}{100}+X\right)} = \frac{14}{11}$
$\frac{\left(80-\frac{4X}{5}\right)}{\left(20+\frac{4X}{5}\right)} = \frac{14}{11}$
$X = 30$

S3. Ans. (e)
Sol. Required probability = $\frac{12_{c_3}}{52_{c_3}}$
$= \frac{11}{1105}$

S4. Ans. (b)
Sol. Let radius of cylinder & cone be 2x cm & 3x cm respectively.
So, height of cylinder = $2x \times \frac{5}{2}$
= 5x cm

ATQ,

$$\frac{\left(\frac{22}{7} \times (2x)^2 \times 5x\right)}{\left(\frac{22}{7} \times \frac{1}{3} \times (3x)^2 \times 14\right)} = \frac{10}{3}$$

$x = 7$

Required area = $2 \times \frac{22}{7} \times 2 \times 7 \times 5 \times 7$

= 3080 cm²

S5. Ans. (d)

Sol. Let A be 100x.

$So, C = \frac{75}{100} \times 100x \times \frac{100}{40}$

$= \frac{375x}{2}$

And, B = $100x \times \frac{100}{80}$

= 125x

ATQ,

$\frac{50}{100} \times 125x + \frac{30}{100} \times \frac{375x}{2} = 95$

$62.5x + 56.25x = 95$

$x = 0.8$

Required value = $\frac{80}{100} \times 100 \times 0.8$

= 64

S6. Ans. (d)

Sol. Let total capacity of tank be 400 units (LCM of $\frac{100}{9}$ and 16).

So, efficiency of pipe – Q = $\frac{400}{16}$

= 25 units/hour

And, efficiency of P & R together = $400 \times \frac{9}{100}$

= 36 units/hour

Required time = $\frac{400}{36-25}$

= $\frac{400}{11}$ hours

S7. Ans. (e)

Sol. Let cost price of article – A be Rs.100x

So, marked price of article – A = $100x \times \frac{160}{100}$

= Rs.160x

And, selling price of article – A = $160x \times \frac{80}{100}$

= Rs.128x

ATQ,

$(160x - 128x) - (128x - 100x) = 20$

$x = 5$

Now, CP of article – B = $100 \times 5 \times \frac{100}{80}$

= Rs.625

S8. Ans. (b)

Sol. Let marks scored by Aman in each of English & Hindi be x.

ATQ,

Aman's marks in Math = $(70 \times 3) - 2x$

$= 210 - 2x$

And, Aman's marks in Science = $\left(\frac{250}{3} \times 3\right) - 2x$

$= 250 - 2x$

Required difference = $(250 - 2x) - (210 - 2x)$

$= 40$

S9. Ans. (a)

Sol. Required ways = $8_{c_3} \times 5_{c_2}$

$= 560$ ways

S10. Ans. (d)

Sol. Let length of train – A & B be 4x meters and 5x meters respectively.

ATQ,

$\frac{4x+5x}{90} = 36 \times \frac{5}{18}$

$x = 100$

Speed of train – A = $\frac{(4 \times 100)+200}{24}$

$= 25$ m/sec

So, speed of train – B = $25 \times \frac{18}{5} + 36$

$= 126$ km/hr.

S11. Ans. (a)

Sol. Mouse sold by store in 2017 & 2018 together = $4500 + 6000$

$= 10500$

Keyboard sold by store in 2017 & 2018 together = $4000 + 5000$

$= 9000$

Required % = $\frac{10500-9000}{9000} \times 100$

$= 16\frac{2}{3}\%$

S12. Ans. (d)

Sol. Average of Mouse, Printer and Speaker sold by store in 2017 = $\frac{4500+3000+6000}{3}$

$= 4500$

Keyboard and Printer together sold by store in 2019 = $(4500 + 6000)$

$= 10500$

Required ratio = $\frac{4500}{10500}$

$= 3:7$

S13. Ans. (c)
Sol. Mouse, UPS & Speakers together sold by store in 2019 = 8000 + 500 + 5000
= 13500
Printer & Speakers together sold by store in 2018 = 4000 + 4500
= 8500
Required difference = 13500 − 8500
= 5000

S14. Ans. (e)
Sol. UPS sold by store in 2017, 2018 & 2019 together = 2000 + 1000 + 500
= 3500
Printers sold by store in 2017 & 2018 together = 3000 + 4000
= 7000
Required % = $\frac{3500}{7000} \times 100$
= 50%

S15. Ans. (c)
Sol. Required revenue = (8000 × 150) + (500 × 800)
= 12,00,000 + 4,00,000
= Rs. 16,00,000 or 16 lacs

Quiz – 5

S1. Ans.(e)
Sol.
$\approx \frac{21}{100} \times 1300 + 5x = \frac{52}{100} \times 4400$
$273 + 5x = 2288$
$5x = 2288 - 273$
$x = \frac{2015}{5}$
$x = 403$

S2. Ans.(a)
Sol.
$\approx 3 \times 5 + \frac{55}{5} + x = 78 \times 2$
$\approx 15 + 11 + x = 156$
$\approx x = 130$

S3. Ans.(a)
Sol.
$\approx \frac{4x+30}{25} + 230 = 320$
$\approx \frac{4x+30}{25} + 230 = 320$
$\approx \frac{4x+30}{25} = 90$
$\approx 4x + 30 = 90 \times 25$
$4x = 2250 - 30$
$4x = 2220$
$x = 555$

S4. Ans.(e)
Sol.

$16\sqrt{?} + 69\sqrt{?} - 10\sqrt{?} \approx \frac{75}{34} \times (?)$

$75\sqrt{?} = \frac{75}{34} \times (?)$

$\Rightarrow \sqrt{?} = \frac{?}{34}$

$\Rightarrow \sqrt{?} = 34$

$\Rightarrow ? = (34)^2$

$\Rightarrow ? = 1156$

S5. Ans.(b)
Sol.

56.08% of $149.92 + \sqrt{28.02 \times 6.98} - 11\frac{1}{9}\%$ $998.9 = ?$

56% of $150 + \sqrt{28 \times 7} - \frac{1}{9} \times 999 \approx ?$

$84 + 14 - 111 = -13$

S6. Ans.(c)
Sol.

79.98% of $? = \sqrt{249.98 \times 44.04 + 40\% \text{ of } 8499}$

$80\% \ of \ ? \simeq \sqrt{250 \times 44 + \frac{40 \times 8500}{100}}$

$\Rightarrow \frac{80}{100} \times ? \simeq \sqrt{11000 + 3400}$

$\Rightarrow ? \simeq \sqrt{14400} \times \frac{10}{8}$

$\Rightarrow ? \simeq 120 \times \frac{10}{8} = 150$

S7. Ans.(a)
Sol.

$? \times 40.01 \div 24.02 \times 27.05 = \frac{593.93}{114.94} \times \frac{2299}{263.98}$

$\Rightarrow ? \times \frac{40}{24} \times 27 \simeq \frac{594}{115} \times \frac{2300}{264}$

$\Rightarrow ? \times 45 \simeq 45$

$\Rightarrow ? = 1$

S8. Ans.(d)
Sol.

$19.99\% \ of \ (40.01 \times \sqrt{?}) = (31.99)^2 + (16.01)^2$

$\Rightarrow \frac{20}{100} \times 40 \times \sqrt{?} \simeq 32^2 + 16^2$

$\Rightarrow \sqrt{?} \simeq \frac{1}{8} \times (1024 + 256)$

$\Rightarrow \sqrt{?} \simeq \frac{1}{8} \times 1280 \simeq 160$

$\Rightarrow ? = (160)^2 = 25600$

S9. Ans.(b)
Sol.

$? + 13.02 \times 49.98 = 420.05 + \frac{44.98}{100} \times 799 + 220.10$

$\Rightarrow ? + 13 \times 50 \simeq 420 + \frac{45}{100} \times 800 + 220$

$\Rightarrow ? + 650 \simeq 420 + 360 + 220$

$\Rightarrow ? = 1000 - 650 = 350$

S10. Ans.(e)
Sol.

$(?)^{\frac{3}{2}} = 255.98 \times (2)^{7.99} \div (8)^{4.99} \times 32.01$

$\Rightarrow (?)^{\frac{3}{2}} \simeq 256 \times (2)^8 \div (8)^5 \times 32$

$\Rightarrow (?)^{\frac{3}{2}} \simeq \frac{2^8 \times 2^8}{2^{15}} \times 2^5$

$\Rightarrow (?)^{\frac{3}{2}} = (2)^6 = 64$

$\Rightarrow ? = (64)^{\frac{2}{3}} = 16$

S11. Ans.(e)
Sol.

$3028 + 672 - 40\%$ of $? + (10)^3 = (60)^2 - \sqrt{10000}$

$3700 + 1000 + 100 - 3600 = \frac{40 \times ?}{100}$

$? = 3000$

S12. Ans.(b)
Sol.

$\frac{127.5 + ?}{8} + 25 \times 40 - \sqrt{256} = (32)^2$

$\frac{127.5 + ?}{8} + 1000 - 16 = 1024$

$127.5 + ? = 40 \times 8$

$? = 320 - 127.5$

$? = 192.5$

S13. Ans.(c)
Sol.

$\sqrt{1225} + \sqrt{2025} + \sqrt{3025} - \sqrt{100} = (?)^3$

$35 + 45 + 55 - 10 = (?)^3$

$(?)^3 = 125$

$? = 5$

S14. Ans. (c)
Sol. $560 + 70 = 630$

S15. Ans.(a)
Sol.
$35 \times 40 + \sqrt{961} - \sqrt{(29)^2} -- 50\%$ of ? = $(23)^2$
$1400 + 31 - 29 - \frac{?}{2} = 529$
$1402 - 529 = \frac{?}{2}$
? = 873 × 2
? = 1746

Quiz – 6

S1. Ans.(e)
Sol.
Required average $= \dfrac{\frac{1}{3}(40+70+55) \times 1000}{\frac{1}{2}(42+28) \times 1000} = 11 : 7$

S2. Ans.(a)
Sol.
Average production of butterscotch drinks in 2014 and 2018 $= \dfrac{40+52}{2} = 46$thousand
Average production of chocolate drinks in 2015 and 2018 $= \dfrac{60+28}{2} = 44$thousand
Required difference = 46thousand − 44thousand = 2 thousand

S3. Ans.(c)
Sol.
Total production of butterscotch drinks in 2016 and 2018 together = 55 + 52 = 107 thousand
Production of chocolate drinks in 2014 and 2017 together = 50 + 75 = 125 thousand
Required less percent $= \dfrac{125-107}{125} \times 100$
$= \dfrac{18}{125} \times 100 = 14\frac{2}{5}\%$

S4. Ans.(b)
Sol.
Average production of butterscotch drinks over last five years $= \dfrac{40+70+55+33+52}{5}$
$= \dfrac{250}{5} = 50$
Required percent $= \dfrac{70-50}{50} \times 100 = 40\%$

S5. Ans.(a)
Sol.
In 2015, 2016 and 2018 the production of butterscotch was more than the production of chocolate drink.
Then,
percent production of butterscotch drinks as compared to chocolate drinks −
In 2015
$= \dfrac{70-60}{60} \times 100 = 16.67\%$
In 2016,
$= \dfrac{55-42}{42} \times 100 = \dfrac{13 \times 100}{42} = 30.95\%$

In 2018,
$$= \frac{52-28}{28} \times 100 = 85.71\%$$
So, production was maximum in year 2018.

S6. Ans.(b)
Sol. Required average = $\frac{(190+172)+(162+164)}{2}$
= 344

S7. Ans.(a)
Sol. Required ratio = $\frac{160+190}{178+172}$
= $\frac{350}{350}$
= 1 : 1

S8. Ans.(d)
Sol. Required % = $\frac{\{(168+172)-160\}}{160} \times 100$
= 112.5 %

S9. Ans.(b)
Sol. Required difference = (158 + 190+162) – (168 + 172+164)
= 510 – 504
= 6

S10. Ans.(c)
Sol. Required total number of pens=168+178+172+164=682

S11. Ans(b)
Sol.
Total lectures taken by male lecturers in Friday = 450 − 250 = 200
Total lectures taken by male lecturers in Tuesday = 350 – 200 = 150
Required percentage = $\frac{200-150}{150} \times 100$
= $\frac{50}{150} \times 100 = 33\frac{1}{3}\%$

S12. Ans(d)
Sol.
Total lectures taken by female lecturers in Wednesday = 100
Total lectures taken by male lecturers in Monday = 400 – 150 = 250
Required ratio = 100 : 250 = 2 : 5

S13. Ans(e)
Sol.
Total lectures taken by male lecturers having age below 50 years in Thursday
= $(250 - 50) \times \frac{60}{100} = 120$
Required difference = 120 – 50 = 70

S14. Ans(a)
Sol.
Total lectures taken by male lecturers in Monday = 400 – 150 = 250
Total lectures taken by male lecturers in Tuesday = 350 – 200 = 150
Total lectures taken by male lecturers in Friday = 450 – 250 = 200
Required average = $\frac{250+150+200}{3}$ = 200

S15. Ans(c)
Sol.
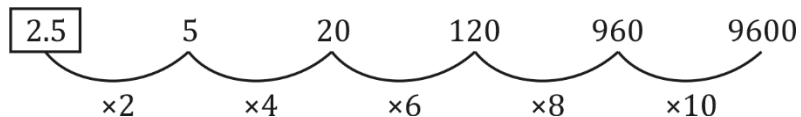Total lectures taken by male lecturers in Wednesday = 300 – 100 = 200
Total lectures taken by male lecturers in Monday = 400 – 150 = 250
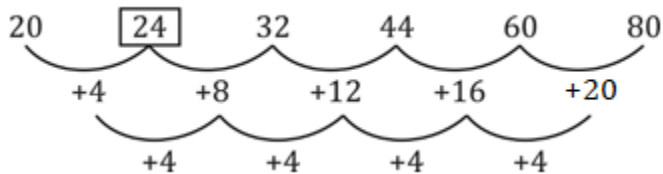Required percentage = $\frac{200}{250} \times 100 = 80\%$

Quiz – 7

S1. Ans.(b)
Sol.
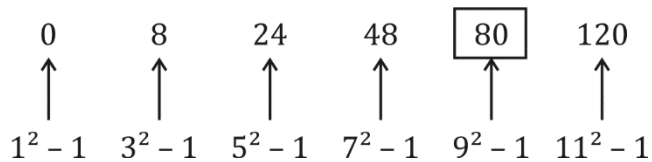
2.5	5	20	120	960	9600
×2	×4	×6	×8	×10	

S2. Ans.(d)
Sol.

20 [24] 32 44 60 80
+4 +8 +12 +16 +20
+4 +4 +4 +4

S3. Ans.(d)
Sol.

0 8 24 48 [80] 120

$1^2 - 1$ $3^2 - 1$ $5^2 - 1$ $7^2 - 1$ $9^2 - 1$ $11^2 - 1$

S4. Ans.(a)
Sol.

16 6 4 6 22 174
×0.5 – 2   ×1 – 2   ×2 – 2   ×4 – 2   ×8 – 2

S5. Ans.(b)
Sol.

55 63 76 95 121 [155]
8 13 19 26 34
5 6 7 8

S6. Ans (b)
Sol

6400   400   50   12.5   6.25   6.25
    ÷ 16   ÷ 8   ÷ 4   ÷ 2   ÷ 1

S7. Ans (d)
Sol.

3   8   23   68   203   608
  ×3-1   ×3-1   ×3-1   ×3-1   ×3-1

S8. Ans (a)
Sol.

115   119   128   153   202   323
    +4   +9   +25   +49   +121
    ↑   ↑   ↑   ↑   ↑
  $(2)^2$ $(3)^2$ $(5)^2$ $(7)^2$ $(11)^2$

S9. Ans (c)
Sol.

243   258   276   297   321   348
    +15   +18   +21   +24   +27
        +3   +3   +3   +3

S10.Ans (b)
Sol.

59   64   74   91   117   154
  $+2^2+1$ $+3^2+1$ $+4^2+1$ $+5^2+1$ $+6^2+1$
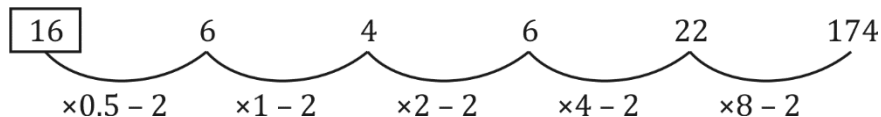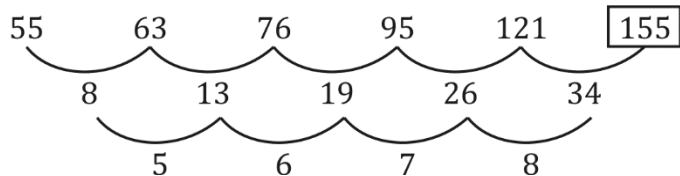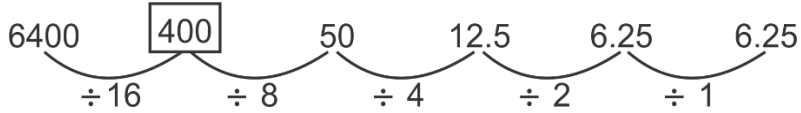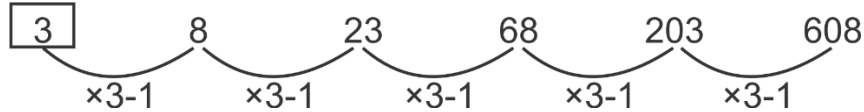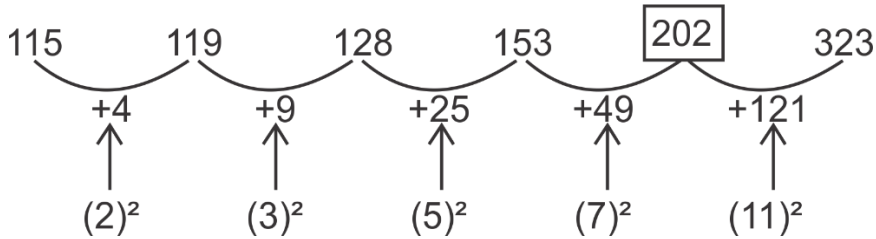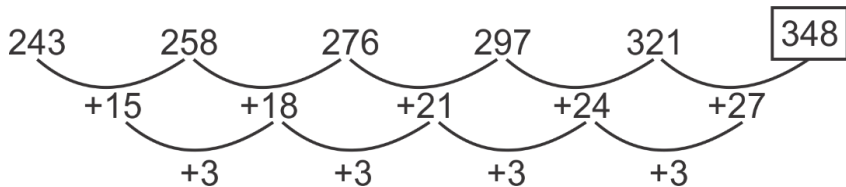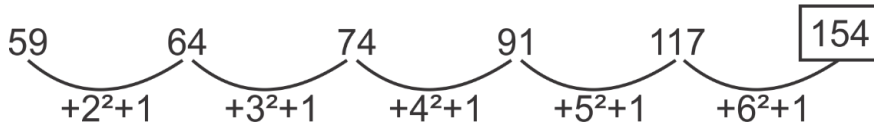
S11. Ans(d)
Sol.
Pattern of series –
26 + 13 = 39
39 + 11 = 50
50 + 13 = 63
? = 63 + 11 = 74
74 + 13 = 87

S12. Ans(b)
Sol.
Pattern of series –
× 0.5 + 1 ,× 1 + 1, × 2 + 1,   × 4 + 1, × 8 + 1
So, ? = 12 × 0.5 + 1 = 7

S13. Ans(a)
Sol.
Pattern of series –
$24 + (5^2 - 1) = 48$
$48 + (7^2 - 1) = 96$
$96 + (9^2 - 1) = 176$
$176 + (11^2 - 1) = 296$
$? = 296 + (13^2 - 1) = 464$

S14. Ans(b)
Sol.
Pattern of series –
$63 = (4^3 - 1)$
$215 = (6^3 - 1)$
$511 = (8^3 - 1)$
$? = (10^3 - 1) = 999$
$1727 = (12^3 - 1)$
$2743 = (14^3 - 1)$

S15. Ans(e)
Sol.
Pattern of series –
$16 \times 5 + 5 = 85$
$85 \times 4 + 4 = 344$
$344 \times 3 + 3 = 1035$
$1035 \times 2 + 2 = 2072$
$2072 \times 1 + 1 = 2073$

Quiz – 8

Sol (1-5):
Let the total employees in A, B & C be x, y & z respectively
$y + z = 720$ ------------(i)
$x + z = 610$ -------------(ii)
$x + y = 650$ -------------(iii)
On adding (i), (ii) & (iii)
$x + y + z = 990$ ------------(iv)
from (i) & (iv)
$x = 270$
from (ii) & (iv)
$y = 380$
from (iii) & (iv)
$z = 340$
male in A $= \frac{270 \times 5}{9} = 150$
female in A $= 270 \times \frac{4}{9} = 120$
male in B $= \frac{380 \times 9}{19} = 180$

female in B = $\frac{380 \times 10}{19}$ = 200

male in C = $\frac{180}{9} \times 8 = 160$

female in C = 340 – 160 = 180

Companies	Male	Female	Total
A	150	120	270
B	180	200	380
C	160	180	340

S1. Ans.(c)
Sol. required difference = (160 + 180) – (150 + 180)
= 10

S2. Ans.(a)
Sol. required % = $\frac{(120+180)-(150+120)}{(120+180)} \times 100$
= 10 %

S3. Ans.(e)
Sol. required % = $\frac{\left(\frac{180+200}{2}\right)}{160} \times 100 = \frac{190}{160} \times 100$
= 118.75%

S4. Ans.(d)
Sol. required ratio = $\frac{(180+160)}{(120+200)} = \frac{340}{320} = 17:16$

S5. Ans.(b)
Sol. total employees in A who have done their masters = 150 × 0.6 + 120 × 0.8=186
required % = $\frac{186}{270} \times 100 = 68\frac{8}{9}$%

Sol (6-10):
Let the population of Hindu to that of Muslim be 3x & 2x respectively.
Total number of male in Muslim = $\frac{2400}{3} \times 5 = 4000$.
Total population of Muslim = 6400.
Total population of Hindu = 9600.
Total population of Gurgaon = 16000.
In Hindu, number of female = 4800.
& number of male = 4800.
In Gurgaon, number of female = $\frac{16000}{20} \times 9 = 7200$
In Gurgaon, number of male = $\frac{16000}{20} \times 11 = 8800$.

	Hindu	Muslims
Male	4800	4000
Female	4800	2400

S6. Ans.(b)
Sol. required % = $\frac{4800}{16000} \times 100 = 30\%$

S7. Ans.(a)
Sol. required difference = (4800 + 4000) – (4800 + 2400) = 1600.

S8. Ans.(d)
Sol. Total population in Gurgaon which are eligible to cast the votes = 11200.
Hindu population which are eligible to cast the votes = 5760
Muslims population which are eligible to cast the votes = 11200 – 5760 = 5440.

S9. Ans.(c)
Sol. Required % = $\frac{2400}{9600} \times 100 = 25\%$

S10. Ans.(b)
Sol. Total population having domicile = 0.8 × 16000 = 12800.
Muslim population having domicile = $\frac{12800}{32} \times 15 = 6000$
Hindu population having domicile = 12800 – 6000 = 6800.
Required difference = {(9600 – 6800) – (6400 – 6000)}
= 2800 – 400 = 2400.

S11. Ans. (c)
Sol. Number of Activa in A & B together in 2019 = $\left(6000 \times \frac{100-50}{100}\right) + \left(4000 \times \frac{100-25}{100}\right)$
= 3000 + 3000
= 6000
Number of Activa in D & E together in 2018 = $\left(8000 \times \frac{100-25}{100}\right) + \left(5000 \times \frac{100-20}{100}\right)$
= 6000 + 4000
= 10000
Required % = $\frac{6000}{10000} \times 100$
= 60%

S12. Ans. (b)
Sol. Average number of aviators in C, D & E in 2018 = $\frac{1}{3} \times \left(\left(6000 \times \frac{30}{100}\right) + \left(8000 \times \frac{25}{100}\right) + \left(5000 \times \frac{20}{100}\right)\right)$
= $\frac{1}{3} \times$ (1800 + 2000 + 1000)
= 1600
Average number of aviators in A & D in 2019 = $\frac{1}{2} \times \left(\left(6000 \times \frac{50}{100}\right) + \left(10000 \times \frac{20}{100}\right)\right)$
= $\frac{1}{2} \times$ (3000 + 2000)
= 2500
Required difference = 2500 – 1600
= 900

S13. Ans. (e)

Sol. Number of Activa in A, B & C together in 2018 = $\left(\left(3000 \times \frac{100-40}{100}\right) + \left(2000 \times \frac{100-50}{100}\right) + \left(6000 \times \frac{100-30}{100}\right)\right)$

= 1800 + 1000 + 4200

= 7000

S14. Ans. (d)

Sol. Number of Avaitor in C & E together in 2019 = $\left(\left(9000 \times \frac{40}{100}\right) + \left(8000 \times \frac{60}{100}\right)\right)$

= 3600 + 4800

= 8400

Number of Activa in D & E together in 2019 = $\left(\left(10000 \times \frac{100-20}{100}\right) + \left(8000 \times \frac{100-60}{100}\right)\right)$

= 8000 + 3200

= 11200

Required % = $\frac{11200-8400}{11200} \times 100$

= 25%

S15. Ans. (a)

Sol. Required number of Avaitor = $\left(3000 \times \frac{40}{100}\right) + \left(2000 \times \frac{50}{100}\right)$

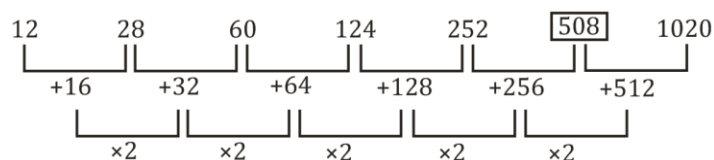= 1200 + 1000

= 2200

Quiz – 9

S1. Ans(a)

Sol.

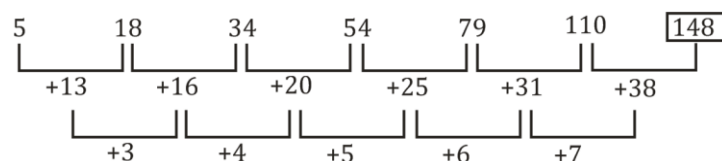Wrong number = 506

Pattern of series –

So, there should be 508 in the place of 506.

S2. Ans(e)

Sol.

Wrong number = 158

Pattern of series –

So, there should be 148 in the place of 158

S3. Ans(d)
Sol.
Wrong number = 2400
Pattern of series –

8		48		240		960		2880		5760		5760
	×6		×5		×4		×3		×2		×1	
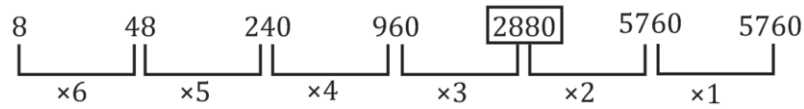
So, there should be 2880 in the place of 2400.

S4. Ans(b)
Sol.
Wrong number = 58
Pattern of series –

64		60		66		62		68		64		70
	−4		+6		−4		+6		−4		+6	
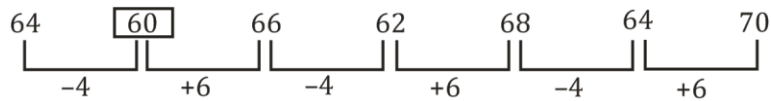
So, there should be 60 in the place of 58.

S5. Ans.(b)
Sol.

60		56		65		49		74		38		87
	-2^2		$+3^2$		-4^2		$+5^2$		-6^2		$+7^2$	
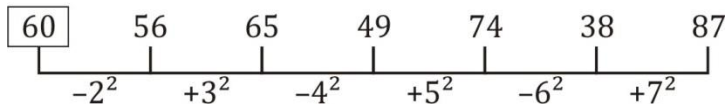
So, there should be 60 in the place of 64

S6. Ans(a)
Sol.
Wrong number = 104
Pattern of series –
12 + 27 = 39
39 + 24 = 63
63 + 27 = 90
90 + 24 = 114
114 + 27 = 141
141 + 24 = 165
So, 114 should come in the place of 104

S7. Ans(d)
Sol.
Wrong number = 562
$13 + 3^3 = 40$
$40 + 4^2 = 56$
$56 + 5^3 = 181$
$181 + 6^2 = 217$
$217 + 7^3 = 560$
$560 + 8^2 = 624$
So, 560 should come in the place of 562.

S8. Ans(c)
Sol.
Wrong number = 134
Pattern of series –
112 + 16 = 128
128 – 20 = 108
108 + 24 = 132
132 – 28 = 104
104 + 32 = 136
$136 - 36 = 100$
So, should be 136 come in the place of 134.

S9. Ans(d)
Sol.
Wrong number = 255
Pattern of series –
$120 = 11^2 - 1$
$145 = 12^2 + 1$
$168 = 13^2 - 1$
$197 = 14^2 + 1$
$224 = 15^2 - 1$
$16^2 + 1 = 257$
$288 = 17^2 - 1$
So, should be 257 come in the place of 255.

S10. Ans(d)
Sol.
Wrong number = 920
Pattern of series –
$5 \times 1 + 1 = 6$
$6 \times 2 + 2 = 14$
$14 \times 3 + 3 = 45$
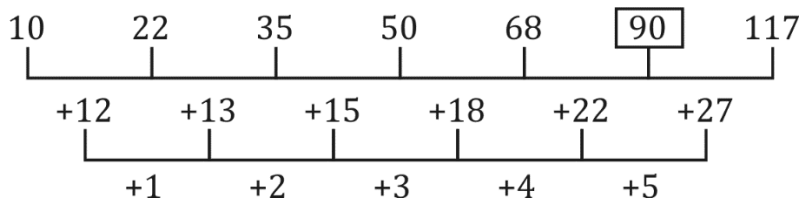$45 \times 4 + 4 = 184$
$184 \times 5 + 5 = 925$
$925 \times 6 + 6 = 5556$
So, 925 should come in the place of 920.

S11. Ans(a)
Wrong number = 92
Pattern of series –

10   22   35   50   68   90   117

+12   +13   +15   +18   +22   +27

+1   +2   +3   +4   +5

So, 90 should come in the place of 92.

S12. Ans(b)
Sol.
Wrong number = 144
Pattern of series –
17 + 15 = 32
32 + 20 = 52
52 + 25 = 77
77 + 30 = 107
107 + 35 = 142
142 + 40 = 182
So, 142 should come in the place of 144

S13. Ans(d)
Sol.
Wrong number = 35
Pattern of series –
$210 \div 7 = 30$
$30 \times 6 = 180$
$180 \div 5 = 36$
$36 \times 4 = 144$
$144 \div 3 = 48$
$48 \times 2 = 96$
So, 30 should come in the place of 35.

S14. Ans(b)
Sol.
Wrong number = 11116
Pattern of series –
$12 \times 1 + 2 = 14$
$14 \times 2 + 2 = 30$
$30 \times 3 + 2 = 92$
$92 \times 4 + 2 = 370$
$370 \times 5 + 2 = 1852$
$1852 \times 6 + 2 = 11114$
So, 11114 should come in the place of 11116

S15. Ans(b)
Wrong number = 741
Pattern of series –
$5 + (15)^2 = 230$
$230 + (14)^2 = 426$
$426 + (13)^2 = 595$
$595 + (12)^2 = 739$
$739 + (11)^2 = 860$
$860 + (10)^2 = 960$
So, 739 should come in the place of 741.

Quiz – 10

S1. Ans.(b)
Sol.
$$\frac{65 \times 360}{100} - \frac{?}{100} \times 250 \approx 139$$
$$\Rightarrow 234 - \frac{25 \times ?}{10} = 139$$
$$\Rightarrow ? = \frac{95 \times 10}{25} = 38$$

S2. Ans.(a)
Sol.
$$\sqrt{912 \div 24 + 184 - 53} \approx ?$$
$$\Rightarrow ? = \sqrt{169} = 13$$

S3. Ans.(c)
Sol.
$$(15)^2 - (5)^3 + \sqrt{1521} + 9 \times 13 \approx (?)^2$$
$$\Rightarrow 225 - 125 + 39 + 117 = (?)^2$$
$$\Rightarrow ? = \sqrt{256} = 16$$

S4. Ans.(e)
Sol.
$$(3750 - ?) \div 55 \approx 23$$
$$\Rightarrow ? = 3750 - 55 \times 23$$
$$? = 2485$$

S5. Ans.(d)
Sol.
$$(3416 \div 56) - (1134 \div ?) \approx 19$$
$$\Rightarrow 61 - \frac{1134}{?} = 19$$
$$\Rightarrow 42 = \frac{1134}{?}$$
$$\Rightarrow ? = 27$$

S6. Ans.(c)
Sol.

Required average = $\dfrac{350 \times \frac{3}{7} + 400 \times \frac{9}{20} + 200 \times \frac{12}{25}}{3} = \dfrac{150 + 180 + 96}{3}$

= 142

S7. Ans.(a)
Sol. Total number of Hollywood movies watched by student
E = $375 \times \frac{16}{25} = 240$

Required percentage = $\frac{(400 - 240)}{400} \times 100 = \frac{160}{400} \times 100 = 40\%$

S8. Ans.(d)

Sol. Total number of Hollywood movies watched by students C and B together = $250 \times \frac{3}{10} + 400 \times \frac{11}{20}$

= 75 + 220 = 295

Total number of Bollywood movies watched by students D and E together = $\frac{200 \times 12}{25} + \frac{375 \times 9}{25}$

= 96 + 135 = 231

Required difference = 295 – 231 = 64

S9. Ans.(b)

Sol. Required ratio = $\frac{250+200}{\frac{400 \times 9}{20} + \frac{250 \times 7}{10} + \frac{375 \times 9}{25}} = \frac{450}{490}$

= 45 : 49

S10. Ans.(e)

Sol. Required percentage = $\frac{(400+200)}{(350+250)} \times 100 = 100\%$

S11. Ans.(d)

Sol.

Let increase per year is $x\%$

So,

$35000 \times \frac{(100+x)}{100} \times \frac{(100+x)}{100} = 55566$

$x = 26\%$

S12. Ans.(c)

Sol.

1st C.P. → 12000 Rs.

1st S.P. → $\frac{12000 \times 80}{100}$ = 9600 Rs.

Now,

2nd C.P. → 9600 Rs.

2nd S.P. → $\frac{9600 \times 130}{100}$ = 12480 Rs.

Profit ⇒ 480 Rs.

S13. Ans.(a)

Sol.

Let sum = P

Now,

$\frac{P \times 7 \times 7}{100} = 1519$

$P = \frac{1519 \times 7 \times 7}{100}$

P = 3100 Rs.

S14. Ans.(e)
Sol. Let amount = 30x
So,
X, Y and Z was to get ⇒ 5x, 10x, 15x respectively
But
X, Y and Z actually get ⇒ 10x, 8x, 12x respectively
X got ⇒ 10x – 5x = 305 ⇒ x = 61
So Z get ⇒ 61 × 12 = 732 Rs.

S15. Ans.(b)
Sol. Let age of Mahendra = x
So age of Niraj = x + 12
Present age of Bhavya = $\frac{(x+12-3)}{3}$
= $\frac{x+9}{3}$
Now,
$\frac{x}{\frac{x+9}{3}} = \frac{2}{1}$
$x = 18$
Niraj's age ⇒ 18 + 12 = 30

Quiz – 11

S1. Ans.(e)
Sol. I. $x^2 + 9x - 22 = 0$
⇒ x² + 11x – 2x – 22 = 0
⇒ (x + 11) (x – 2) = 0
⇒ x = – 11, 2
II. 2y² – 7y + 6 = 0
⇒ 2y² – 4y – 3y + 6 = 0
⇒ 2y(y–2)–3(y–2) =0
⇒ (y–2) (2y–3) = 0
⇒ y = 2, $\frac{3}{2}$
No relation

S2. Ans.(e)
Sol. I. 2y² – 13y – 34 = 0
⇒ 2y² – 17y + 4y – 34 = 0
⇒ y(2y–17) + 2(2y–17) = 0
⇒ (2y–17) (y+2) = 0
⇒ y = $\frac{17}{2}$, – 2
II. 3x² – 11x – 20 = 0
⇒ 3x² – 15x + 4x – 20 = 0
⇒ 3x (x–5) + 4(x–5) =0
⇒ (x – 5) (3x + 4) = 0
⇒ x = 5, $\frac{-4}{3}$
No relation

S3. Ans.(b)
Sol. I. $x^4 = 256$
$\Rightarrow x = \pm 4$
II. $y^2 - 16y + 64 = 0$
$\Rightarrow (y - 8)^2 = 0$
$\Rightarrow y = 8$
$y > x$

S4. Ans.(e)
Sol.
I. $x^2 + 4x - 12 = 0$
$x^2 + 6x - 2x - 12 = 0$
$x = -6, 2$
II. $2y^2 + 7y + 6 = 0$
$2y^2 + 4y + 3y + 6 = 0$
$2y (y + 2) + 3 (y + 2) = 0$
$y = -2, \frac{-3}{2}$
∴ No relation

S5. Ans.(b)
Sol. I. $2x + 3y = 4$
II. $4x + 5y = 6$
Solving eq. (I) and (II),
$(2x + 3y = 4) \times 2$
$4x + 5y = 6$
$y = 2$
Put $y = 2$ in eq. (I),
$2x + 6 = 4$
$\Rightarrow x = -1$
$y > x$

S6. Ans(d)
Sol.
I. $x = \pm 4$
II. $y = +4$
So, $x \leq y$

S7. Ans(d)
Sol.
I. $x^2 + 23x + 132 = 0$
$x^2 + 12x + 11x + 132$
$x(x + 12) + 11(x + 12)$
$(x + 12) (x + 11)$
$x = -11 , -12$

II. $y^2 + 11y + 6y + 66 = 0$
$y(y + 11) + 6(y + 11) = 0$
$(y + 11)(y + 6) = 0$
$y = -11, -6$
So, $x \leq y$

S8. Ans(d)
Sol.
I. $x^2 - 7x - 6x + 42 = 0$
$x(x - 7) - 6(x - 7) = 0$
$(x - 6)(x - 7) = 0$
$x = 6, 7$
II. $y^2 - 8y - 7y + 56 = 0$
$y(y - 8) - 7(y - 8) = 0$
$(y - 8)(y - 7) = 0$
$y = 8, 7$
So, $x \leq y$

S9. Ans(e)
Sol.
I. $x = \pm 11$
II. $y^2 + 13y - 11y - 143 = 0$
$y(y + 13) - 11(y + 13) = 0$
$(y + 13)(y - 11)$
$y = -13, 11$
So, no relation can be established between x and y.

S10. Ans(d)
Sol.
I. $x^2 - 12x - 8x + 96 = 0$
$x(x - 12) - 8(x - 12) = 0$
$(x - 8)(x - 12) = 0$
$x = 8, 12$
II. $y^2 - 16y - 12y + 192 = 0$
$y(y - 16) - 12(y - 16) = 0$
$(y - 12)(y - 16) = 0$
$y = 12, 16$
$x \leq y$

S11. Ans.(c)
Sol.
I. $x^2 + 12x + 35 = 0$
$x^2 + 7x + 5x + 35 = 0$
$(x + 7)(x + 5) = 0$
$\therefore x = -5 \text{ or } -7$

II. $y^2 + 9y + 20 = 0$

$y^2 + 5y + 4y + 20 = 0$

$(y + 5)(y + 4) = 0$

$y = -5, -4$

$\Rightarrow x \leq y$

S12. Ans.(d)

Sol.

I. $x^2 - 15x + 54 = 0$

$x^2 - 9x - 6x + 54 = 0$

$(x - 9)(x - 6) = 0$

$\therefore x = 9$ or 6

II. $y^2 - 23y + 132 = 0$

$y^2 - 11y - 12y + 132 = 0$

$(y - 11)(y - 12) = 0$

$y = 11$ or 12

$\therefore x < y$

S13. Ans.(e)

Sol.

I. $6x^2 + 5x + 1 = 0$

$6x^2 + 3x + 2x + 1 = 0$

$3x(2x + 1) + 1(2x + 1) = 0$

$x = -\frac{1}{2}$ or $-\frac{1}{3}$

II. $15y^2 + 11y + 2 = 0$

$15y^2 + 6y + 5y + 2 = 0$

$3y(5y + 2) + 1(5y + 2) = 0$

$\therefore y = -\frac{2}{5}$ or $-\frac{1}{3}$

$\therefore$ no relation can be established

S14. Ans.(e)

Sol.

I. $x^2 - 3x - 28 = 0$

$x^2 - 7x + 4x - 28 = 0$

$x(x - 7) + 4(x - 7) = 0$

$\therefore x = 7$ or -4

II. $y^2 - y - 12 = 0$

$y^2 + 3y - 4y - 12 = 0$

$y(y + 3) - 4(y + 3) = 0$

$\therefore y = -3$ or 4

$\therefore$ no relation can be established

S15. Ans.(b)

Sol.

I. $x^2 - 2x - 3 = 0$

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

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

$\therefore x = 3 \text{ or } -1$

II. $y^2 + 5y + 6 = 0$

$y^2 + 3y + 2y + 6 = 0$

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

$\therefore y = -2 \text{ or } -3$

$\therefore x > y$

Quiz – 12

S1. Ans.(d)

Sol.

80% of 350 + 45% of 800 = ? × 256

280 + 360 = ? × 256

$? = \frac{640}{256} = 2.5$

S2. Ans.(e)

Sol.

115% of 360 + 180% of 270 = ? × 225

414 + 486 = ? × 225

$? = \frac{900}{225} = 4$

S3. Ans.(b)

Sol.

$9^? \times 729 = \frac{3^4 \times 9^6}{81}$

$9^? = \frac{9^2 \times 9^6}{9^2 \times 9^3} = 9^3$

$\Rightarrow ? = 3$

S4. Ans.(d)

Sol.

$5\frac{1}{4} + 7\frac{1}{3} + 4\frac{1}{2} = 3\frac{1}{6} + ? + 5\frac{1}{6}$

$(5 + 7 + 4) + \left(\frac{1}{4} + \frac{1}{3} + \frac{1}{2}\right) - 3 - 5 - \frac{1}{6} - \frac{1}{6} = ?$

$8 + \frac{1}{4} + \frac{1}{2} + \frac{1}{3} - \frac{1}{3} = ?$

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

S5. Ans.(a)
Sol. Wrong no. is 1020.
3 × 1 + 2 = 5
5 × 2 + 4 = 14
14 × 3 + 6 = 48
48 × 4 + 8 = 200
200 × 5 + 10 = 1010
1010 × 6 + 12 = 6072
So, there should be 1010 instead of 1020.

S6. Ans.(b)
Sol. Wrong no. is 590
48 × 2 – 12 = 84
84 × 2 – 12 = 156
156 × 2 – 12 = 300
300 × 2 – 12 = 588
588 × 2 – 12 = 1164
1164 × 2 – 12 = 2316
So, there should be 588 instead of 590.

S7. Ans.(e)
Sol. Wrong no. is 12

–18		–8		10		36		70		112		162
	+10		+18		+26		+34		+42		+50	
		+8		+8		+8		+8		+8		
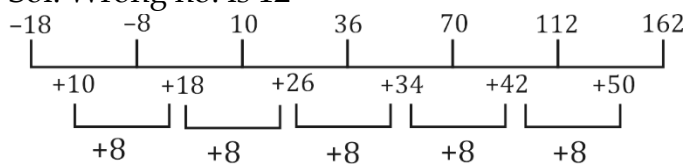
So, there should be 10 instead of 12.

S8. Ans(c)
Sol.
2 6 12 20 30 42 56
↑ ↑ ↑   ↑ ↑   ↑   ↑
$1^2 + 1$ $2^2 + 2$ $3^2 + 3$ $4^2 + 4$ $5^2 + 5$ $6^2 + 6$ $7^2 + 7$
Wrong number is 24.

S9. Ans.(c)
Sol.
Pattern of series
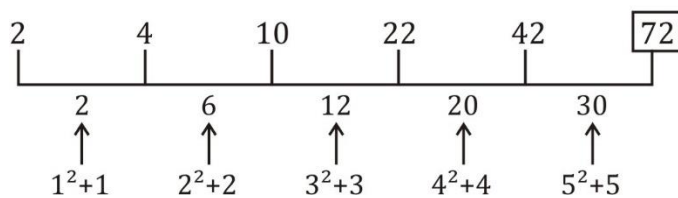
2		4		10		22		42		72
	2		6		12		20		30	
	↑		↑		↑		↑		↑	
	1^2+1		2^2+2		3^2+3		4^2+4		5^2+5	

S10. Ans.(d)
Sol.
Pattern of series

8   4   6   15   52.5   236.25

×0.5   ×1.5   ×2.5   ×3.5   ×4.5

S11. Ans.(a)
Sol.
Pattern of series

15   34   72   148   300   604

+19×1   +19×2   +19×4   +19×8   +19×16

S12. Ans.(d)
Sol.
Pattern of series

25   30   20   40   0   80

+5   −10   +20   −40   +80

×2   ×2   ×2   ×2
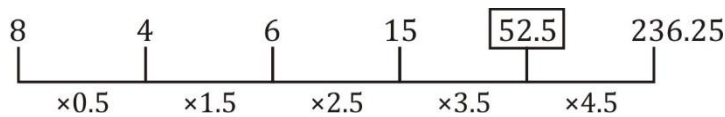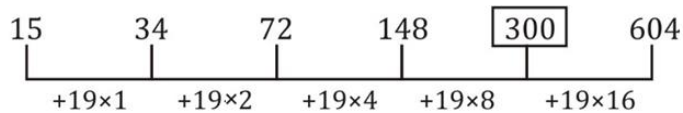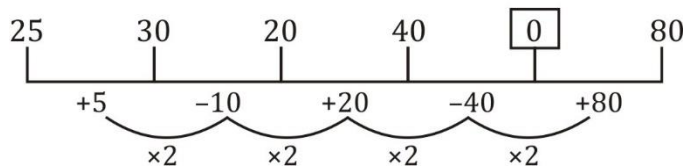
S13. Ans.(b)
Sol. $\because 3599 \div 20 + 110 \times 24.9 + 418 = ?$
$3600 \div 20 + 110 \times 25 + 418 = ?$
$? \cong 180 + 2750 + 418$
$? = 3348$
$? \cong 3350$

S14. Ans.(c)
Sol. $25 \times 12.9 + \sqrt{399} + 1145 = ?$
$25 \times 13 + \sqrt{400} + 1145 = ?$
$? = 325 + 20 + 1145$
$? = 345 + 1145$
$? \cong 1490$

S15. Ans.(b)
Sol. $3453.9 + 6119.8 + 1729.9 = ?$
$? = 3454 + 6120 + 1730$
$? = 11304$
$? \cong 11310$

S16. Ans.(e)

Sol. $140 \times 12.9 - 442 \div 22 + 979 = ?$

$140 \times 13 - 440 \div 22 + 979 = ?$

$? = 1820 - 20 + 979$

$? = 1800 + 979$

$? = 2779$

$? \cong 2780$

S17. Ans.(b)

Sol. (I) $x^2 - 14x + 48 = 0$

$\therefore x^2 - 8x - 6x + 48 = 0$

$x(x - 8) - 6(x - 8) = 0$

$(x - 8)(x - 6) = 0$

$\therefore x = 8, 6$

(II) $y^2 - 18y + 80 = 0$

$\therefore y^2 - 8y - 10y + 80 = 0$

$\therefore y(y - 8) - 10(y - 8) = 0$

$\therefore (y - 8)(y - 10) = 0$

$\therefore y = 8, 10$

$\therefore x \le y$

S18. Ans.(c)

Sol. (I) $x^3 + 328 = 2525$

$\therefore x^3 = 2525 - 328$

$\therefore x^3 = 2197$

$\therefore x = 13$

(II) $y^3 + 349 = 1680$

$\therefore y^3 = 1680 - 349$

$\therefore y^3 = 1331$

$\therefore y = 11$

$\therefore x > y$

S19. Ans.(e)

Sol. (I) $x^2 - 19x + 88 = 0$

$\therefore x^2 - 8x - 11x + 88 = 0$

$\therefore x(x - 8) - 11(x - 8) = 0$

$\therefore (x - 8)(x - 11) = 0$

$\therefore x = 8, 11$

(II) $y^2 - 21y + 108 = 0$

$\therefore y^2 - 9y - 12y + 108 = 0$

$\therefore y(y - 9) - 12(y - 9) = 0$

$\therefore (y - 12)(y - 9) = 0$

$\therefore y = 9, 12$

So, no relation

S20. Ans.(d)
Sol. (I) $x^3 = 1728$

$\therefore x = \sqrt[3]{1728}$

$\therefore x = 12$

(II) $y^2 = 144$

$\therefore y = \sqrt{144}$

$y = \pm 12$

$\therefore x \geq y$

Quiz – 13

S1. Ans.(c)
Sol. Let odd numbers are x – 4, x – 2, x, x + 2, x + 4

$\therefore \frac{x-4+x-2+x+x+2+x+4}{5} = 33$

$\Rightarrow x = 33$

$\therefore$ least odd number = 33 – 4 = 29

S2. Ans.(c)
Sol.
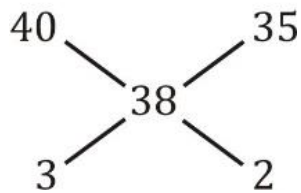
ATQ, 5 → 50.

1 → 10.

2 → 20

Number of Girls = 20.

S3. Ans.(e)
Sol. Total present age of five employee

= 54 × 5 + 3 × 5 = 270 + 15 = 285 years

Total present age of all six employee = 52 × 6 = 312

Age of new employee = 312 – 285 = 27 years

S4. Ans.(b)
Sol.

Let four numbers → a, b, c, d

Let initially it replaced 'a'

$= \frac{x+b+c+d}{4} = \frac{a+b+c+d}{4} + 1$ …(i)

Let then it replaced 'b'

$= \frac{x+a+c+d}{4} + 1 = \frac{a+b+c+d}{4}$ …(ii)

Solving (i) and (ii)

b – a = 8

S5. Ans.(d)
Sol.
Total present age of father and son = (36 + 3) × 2 = 78 years
Let present age of son be x years.
The, present age of father = (78 – x) years.
Present age of mother = (2x – 3) years.
ATQ,
$\frac{(2x-3)+3}{78-x-4} = \frac{24}{25}$
⇒ 50x = 74 × 24 – 24x
⇒ x = 24
Required average = $\frac{24+45+54}{3}$ = 41 years.

S6. Ans.(e)
Sol.
$\frac{40}{100} \times (X + 2000) = 1300 \Rightarrow X = 1250$
$\frac{60}{1200} \times (1250 + Y) = 1830 \Rightarrow Y = 1800$
X : Y = 1250 : 1800 = 25 : 36

S7. Ans.(e)
Sol.
40 × P = 75 × Q
⇒ 8P = 15Q
Required percent = $\frac{15 \times 1.5Q}{20Q} \times 100 = 112\frac{1}{2}\%$

S8. Ans.(d)
Sol.
Using the formula,
% reduction in consumption
$= \frac{25}{(100+25)} \times 100$
= 20%

S9. Ans.(d)
Sol.
Let fraction is $\frac{x}{y}$
So ATQ
$\frac{x}{y} \times \frac{120}{100} = \frac{6x}{5y}$
$\Rightarrow \frac{6x(100+240)}{5y(150)} = \frac{6}{5}$
$\frac{x}{y} = \frac{15}{34}$

S10. Ans.(b)
Sol.
$$\frac{20}{100}(X + 2500) = \frac{40}{100}(X + 900)$$
$0.2X + 500 = 0.4X + 360$
$0.2X = 140$
$X = 700$
50% of X $= \frac{1}{2} \times 700 = 350$

S11. Ans.(d)
Sol.
Let no. of balls in bag x and y is $2a$ and $3a$ respectively
$\Rightarrow$ Now 5 balls pare taken out of bag y and put in bag x
$\therefore \frac{2a+5}{3a-5} = \frac{1}{1}$
$\Rightarrow 2a + 5 = 3a - 5$
$a = 10$
$\therefore$ No. of balls in each bag is
$x \Rightarrow 2 \times 10 + 5 = 25$
$y \Rightarrow 3 \times 10 - 5 = 25$

S12. Ans.(a)
Sol. Let earning of A & B be 2x and x respectively then
ATQ,
$\frac{2x-5y}{x-3y} = \frac{4}{1}$
$\Rightarrow 2x - 5y = 4x - 12y$
$\Rightarrow 2x = 7y$
$\Rightarrow x = 7/2 \, y$ _____ (i)
again, (2x – 5y) + (x – 3y) = 5,000
$\Rightarrow 3x - 8y = 5,000$
using eq (i), we get
y = 2,000
then x = 7,000
So, required income of B = Rs 7,000

S13. Ans (c)
Sol. Let two numbers are 5x and 7x respectively.
ATQ
$\frac{5x+30}{7x+30} = \frac{3}{4}$
$20x + 120 = 21x + 90$
$x = 30$
So, two numbers are 150 and 210 respectively.
Now, required ratio $= \frac{150-10}{210-10} = \frac{140}{200} = \frac{7}{10}$

S14. Ans.(e)

Sol. Let number A and B are 11x and 19x respectively

ATQ,

$\frac{11x+19}{19x+11} = \frac{2}{3}$

33x + 57 = 38x + 22

5x = 35

x = 7

Required answer = B + 20

= 19 × 7 + 20 = 153

S15. Ans.(d)

Sol.

Let income of A and B be Rs 5x and Rs 9x respectively

Expenditure of A=Rs $\frac{15}{8}x$

Saving of A=$Rs \frac{25}{8}x$

Expenditure of B= Rs 4x

Saving of B= Rs 5x

ATQ

$\frac{65}{8}x = 1950$

x=240

required difference= Rs 960

Quiz – 14

S1. Ans.(e)

Sol.

Age of Ayush = $\frac{50}{2} + 11 = 36$ years

Age of Abhishek = $\frac{3}{4} \times 36 = 27$ years.

Required difference = 36 – 27 = 9 years.

S2. Ans.(e)

Sol.

Let 4 consecutive even no. are x, x + 2, x + 4 & x+ 6

& 3 consecutive odd no. are y -2, y, y + 2

ATQ,

4x + 12 – 3y = 94

4x – 3y = 82 …(i)

$\frac{x+6+y-2}{2} = 42$

x +y = 84 -4

x + y = 80 …(ii)

multiplying. (ii) by 3 & solving with …(i)

x = 46

∴ Second lowest even no. = 48

S3. Ans.(b)
Sol.
Sum of Present age Ritu & Priya = 22 × 2 = 44
Let,
Ritu's age = x
Priya's age = 44 - x
ATQ,
$\frac{44-x+8}{x+8} = \frac{7}{8}$
8(52 – x) = 7x + 56
$\Rightarrow x = \frac{360}{15} = 24$
Required ratio $= \frac{24-2}{44-24-2} = \frac{22}{18} = \frac{11}{9}$

S4. Ans.(d)
Sol.
Present age of Laxmi = 14 + 2 = 16 years
Sum of age of Kapil and Renu = 11.5 × 2 = 23 years
Present age of Kapil = 16.5 × 2 – 6 – 16
= 11 years
Age of Renu 10 years hence = 23 -11 + 10= 22 years

S5. Ans.(a)
Sol.
Let present age of son be x years
Present age of father=$(2x + 6)\ yr$
ATQ
$\frac{(x+4)+(2x+6+4)}{2} = 34$
$x = 18$
Required ratio=$\frac{18}{42} = 3:7$

S6. Ans (a)
Sol.
Let present age of Lalit and Vikas be 'x years' and 'y years' respectively
ATQ
$x - 10 = 5(y - 10)$
$x = 5y - 40$ …………..(i)
And $x + 20 = 2(y + 20)$
$x = 2y + 20$ …………….(ii)
From (i) and (ii)
$x = 60\ and\ y = 20$
Required ratio $= \frac{20-5}{60-5} = \frac{15}{55}$
$= 3 : 11$

S7. Ans.(d)
Sol.
Sum of present age of couple = 2 × 29 = 58
Age of family after 8 years
= 58 + 8 × 2 + (8 – 2) + (8 – 4)
= 58 + 16 + 6 + 4
= 84
Required average = $\frac{84}{4}$ = 21

S8. Ans (a)
Sol. Let the age of Rashmi 16 years hence be 10x years Then, 16years hence Neha's age = 13x years
Present age of Rashmi = (10x–16) years
Present age of Neha = (13x–16) years
ATQ,
$\frac{10x-16-8}{13x-16-8} = \frac{4}{7}$
⇒ 70x–168 =52x–96
⇒ 18x = 72
⇒ x = 4
Present age of Rashmi = 24 years.
Present age of Neha = 36 years.
Required % = $\frac{12}{24} \times 100 = 50\%$

S9. Ans.(b)
Sol. ATQ,
Let present age of A, B, C, D be 6x, 8x, 11x and 15x years respectively.
(6x – 4) + (8x – 4) + (11x – 4) + (15x – 4) = 64
40x = 80
x = 2
Difference of present age of B and D is
(15 – 8) × 2 = 14 years

S10. Ans(e)
Sol.
Let the numerator and denominator of a fraction be x and y respectively
ATQ
$x + 4 = 1.5y$ ……… (i)
And $\frac{x+5}{2y} = \frac{x}{y}$
x=5
and y=6
Original fraction=$\frac{5}{6}$
Required fraction=$\frac{5}{6} \times 2 = \frac{5}{3}$

S11. Ans(e)

Sol. Let the two -digit no. be $(10a + b)$, where a is tens digit and b is unit digit.

ATQ

$(10a + b) + 0.2(10a + b) = (10b + a)$

$11a = 8.8b$

$\left(\frac{a}{b} = \frac{4}{5}\right)$

Since the no. is two- digit number. So the only possible no. is 45 and reverse of it is 54.

So, 40% of no.=18

S12. Ans.(d)

Sol.

Let, S_1 series be → (x - 4), (x -2), (x), (x+2), (x +4)

Let S_2 series be→ (y - 4), (y - 2), (y), (y + 2), (y + 4)

ATQ,

x = 1.5y

And, x -4 + y – 4 = 67

$\Rightarrow$ x + y = 75

$\Rightarrow$ 2.5y = 75

$\Rightarrow$ y = 30

largest no. of S_2 series = y + 4 = 30 + 4 = 34

S13. Ans(d)

Sol.

Let present age of Chintu be 5x years

Then present age of Binny=8x years

And present age of Amit=6x years

ATQ

$8x - 5x - (8x - 6x)=6$

$x = 6$

Required average=40 years

S14. Ans. (a)

Sol.

Let age of Ravi and Vicky, 4 years ago was 5x years and 6x years respectively

2 years later, age of Ravi=(5x+6) years

Age of Rocky, 2 years later=$\left(\frac{6x+4}{4} \times 5\right) + 2\ years$

ATQ

(5x+6) + $\left(\frac{6x+4}{4} \times 5\right)$ + 2=63

x=4

required difference= 4 years

S15. Ans.(b)
Sol.
Let the fraction be $\frac{x}{y}$

ATQ,
$\frac{2.5x}{0.75y} = \frac{8}{9}$

$\Rightarrow \frac{x}{y} = \frac{4}{15}$

Quiz – 15

S1. Ans.(b)
Sol.
Let B's investment = a
And,
Total investment = 28x
And total profit = 15x
A's investment = 28x -a
Ratio of profit share between A and B = (28x – a) : a
Let Profit of A = (28x -a)b
Let Profit of B = (ab)
Now,
28xb – ab +ab = 15x
$\Rightarrow$ 28xb = 15x
$\Rightarrow$ b = $\frac{15}{28}$
B's profit =ab = $\frac{15}{28} \times$ a = 5250
B's investment = a = 5250 $\times \frac{28}{15}$ = 9800

S2. Ans.(d)
Sol.
Ratio of investment of Anurag and Roshan = $\frac{(12,000 \times 12) : (14000 \times 6 + 10500 \times 6)}{48 : 49}$

So, profit share of Anurag = $\frac{9700}{(48+49)} \times 48$ = Rs. 4800

S3. Ans.(b)
Sol.
Let A increased his sum by x and B decreased his sum by x
ATQ,
$\frac{45000 \times 4 + (45000 + x) \times 8}{60000 \times 4 + (60,000 - x) \times 8} = \frac{1}{1}$
$\Rightarrow 45,000 + 90,000 + 2x = 60,000 + 120000 - 2x$
$\Rightarrow 4x = 45,000$
$\Rightarrow x$ = Rs. 11,250

S4. Ans.(c)
Sol.
Let x ltr. of water is added.

$\therefore \dfrac{\frac{3}{7} \times 84}{\frac{4}{7} \times 84 + x} = \dfrac{2}{5}$

$\Rightarrow \dfrac{36}{48 + x} = \dfrac{2}{5}$

$\Rightarrow 90 = 48 + x$

$\Rightarrow x = 42$ ltr.

S5. Ans.(a)
Sol.
Let initial quantity of milk and water be x and y respectively
Now
$\dfrac{x}{y} = \dfrac{3}{2}$

$x = \dfrac{3}{2}y$ ...(i)

Again
$\dfrac{x+4}{y} = \dfrac{2}{1}$

$x - 2y + 4 = 0$ ...(ii)

Put (i) in (ii)

$\dfrac{3}{2}y - 2y = -4$

$y = 8$

So $x = 12$ liter

So total quantity = 12 + 8 = 20 liter

S6. Ans.(d)
Sol.
Percentage of milk in first jar = 64%
Percentage of milk in second jar = (100 – 26) = 74%
Now using allegation method

Jar 1   Jar 2
64%   74%

        68%

6   4
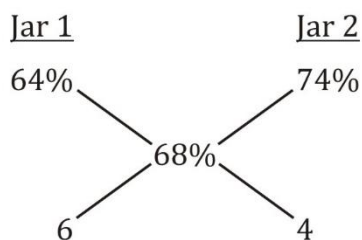
Required ratio = 3 : 2

S7. Ans.(e)
Sol.
On selling mixture, retailer earns 150% profit
$\Rightarrow$ If container contains 5 l of mixture then quantity of milk is 2 l.
Let x l of water is added in container

ATQ

$$\frac{60}{40+x} = \frac{2}{3}$$

$\Rightarrow 180 = 80 + 2x \Rightarrow \boxed{x = 50\ l}$

S8. Ans.(c)
Sol.
Let initially grapes juice = 4x
Alcohol = 5x
ATQ,

$$\frac{5x+18}{4x} = \frac{9}{4}$$

$\Rightarrow 4x = 18$

$\Rightarrow x = 4.5$ li

$\therefore$ Required answer = 4 × 4.5 = 18 liters

S9. Ans.(c)
Sol.
Let the quantity of water and alcohol in the initial mixture be 8x lit and 5x lit respectively.
ATQ,

$$\frac{5x}{8x+4} = \frac{5}{9}$$

$\Rightarrow 45x = 40x + 20$

$\Rightarrow x = 4$

Quantity of initial mixture=13x=13× 4 = 52 lit

S10. Ans.(a)
Sol.
Let the alcohol added be x liter
ATQ,

$$\frac{9+x}{30+x} = \frac{2}{5}$$

Or, 45 + 5x = 60 + 2x
Or, 3x = 15
Or, x = 5 ltr.

S11. Ans.(d)
Sol.
Rahul invested for 12 months and Karan invested for 10 months.
Let amount invested by Rahul is x.
ATQ,

$$\frac{12 \times x}{3500 \times 10} = \frac{9}{7}$$

$$x = \frac{9 \times 3500 \times 10}{7 \times 12}$$

= Rs. 3750

S12. Ans.(c)
Sol.
Let price of type A wheat be Rs. x per kg and price of type B wheat be Rs. y per kg
ATQ,
12 × x + 18 × y = 30 × 1.2x
18y = 36x – 12x
18y = 24x
x : y = 3 : 4

S13. Ans.(c)
Sol.
Let Y invested for 'x' months
So
profit ratio
$\quad$ **X** $\quad$: $\quad$ **Y**
12 × 8000 : x × 5000
$\quad$ 96 $\quad$: $\quad$ 5x
Given that
$\frac{96}{5x} = \frac{3000}{4250 - 3000}$
x = 8 months

S14. Ans.(b)
Sol.
Let R's investment = x
Q's investment = x + 6000
P's investment = x + 14000
ATQ,
x + x + 6000 + x + 14000 = 74000
x = Rs. 18,000
P : Q : R = 32000 : 24000 : 18000 = 16 : 12 : 9
Q's profit = $\frac{12}{37}$ × 44,400 = Rs. 14,400

S15. Ans.(d)
Sol.
Left milk in container = 75 × $\left(1 - \frac{15}{75}\right)^2$ = 48 liters

Quiz – 16

S1. Ans.(c)
Sol. daily wage of a woman = $\frac{1250}{10 \times 5}$ = 25 Rs
Daily wage of a man = Rs 50
Daily wage of all men = $\frac{1600}{8}$ = 200 Rs
Total no. of man = $\frac{200}{50}$ = 4

S2. Ans.(b)
Sol.

$12M + 13B = \frac{4893.75}{3}$

$12M + 13B = 1631.25$ … (i)

$5M + 6B = \frac{3562.5}{5}$

$5M + 6B = 712.5$ … (ii)

$60M + 65B = 8156.25$

$\underline{60M + 72B = 8550.0}$

$\qquad\quad 7B = 393.75$

$\qquad\quad\quad B = 56.25$

$5M = 712.5 - 337.50$

$M = 75$

One day wage of 3M and 4B = $3 \times 75 + 4 \times 56.25 = 450$

Rs. 3150 can be earned in $= \frac{3150}{450} = 7$ days

S3. Ans.(c)
Sol.

We know work efficiency ratio of A to B = 5 : 4

Let time taken by A alone to complete the work = 4x

And by B to complete the work alone = 5x

Atq,

$5x - 4x = 6$

$\Rightarrow x = 6$

So, A alone can complete the work in 24 day

And, B alone can complete the work in 30 day

A and B working together can complete the work in

$= \frac{1}{\frac{1}{30}+\frac{1}{24}} = \frac{120}{9} = 13\frac{1}{3}$ days

S4. Ans.(b)
Sol.

Let A does 100n units of work in one day

So C does 120n units of work in one day

And B does 75n units of work in one day

Total work = 120n × 45 units

So, 'X' $= \frac{120n \times 45}{(75n + 100n)}$ days.

$= \frac{5400}{175}$ days

$= \frac{216}{7}$ days

$= 30\frac{6}{7}$ days

S5. Ans.(b)
Sol.
(Priya and Monika)'s 1 day work alternatively
$= \frac{1}{18} + \frac{1}{30} = \frac{8}{90}$
(Priya and Monika)'s 22 days work
$= \frac{8 \times 11}{90} = \frac{88}{90}$
Remaining work $= 1 - \frac{88}{90} = \frac{1}{45}$
$\therefore \frac{1}{45}$ work done by Priya $= \frac{2}{5}$ days
Total time $= 22\frac{2}{5}$ days.

S6. Ans.(b)
Sol.
Ratio of efficiency of A to B = 7 : 5
So ratio of time required to complete a work = 5 : 7
Now ATQ,
(7 – 5) → 6 day
2 → 6
$5 \to \frac{6}{2} \times 5 = 15 \ days$
So, 'A' can complete the work alone in 15 days

S7. Ans.(c)
Sol.
Efficiency ratio
$$\begin{array}{ccc} P + Q & R & \to P + Q + R \\ 2 & 1 & 3 \end{array}$$

$$\begin{array}{ccc} P + R & Q & \to P + Q + R \\ 3 & 1 & 4 \end{array}$$

Make P+Q+R equal in both the cases
$$\Rightarrow \begin{array}{ccc} P + Q & R & P + Q + R \\ 2 \times 4 & 1 \times 4 & 3 \times 4 \end{array}$$
$$\begin{array}{ccc} P + R & Q & P + Q + R \\ 3 \times 3 & 1 \times 3 & 4 \times 3 \end{array}$$
R's efficiency = 4
Q's efficiency = 3
P's efficiency = 5
Total work = (4 + 3 + 5) × 36
Time by R = $\frac{12 \times 36}{4}$ = 108 days.

S8. Ans.(b)
Sol.
Let efficiency of 1 man and 1 woman is m and w respectively.
So, total work
$5m \times 16 = 8w \times 15$
$\frac{m}{w} = \frac{3}{2}$
Work done in $= \frac{3 \times 5 \times 16}{6+6} = 20$ days

S9. Ans.(d)
Sol. Ratio of efficiency of A and B = 3 : 5
$\Rightarrow$ Time taken be A and B alone to complete the work = 5 : 3
Ratio of time taken by B and C alone to complete the work = 4 : 5
$\Rightarrow$ Ratio of time taken by A, B and C alone to complete the work = 20 : 12 : 15
Let, A, B and C alone can complete the work alone is 20x, 12x and 15x days respectively.
ATQ,
$\frac{12}{20x} + \frac{12}{12x} = \frac{80}{100}$
$\Rightarrow \frac{144+240}{240x} = \frac{4}{5}$
$\Rightarrow \frac{5 \times 384}{4 \times 240} = x$
$\Rightarrow x = 2$
Let in 'a' days 'B' and 'C' can complete 60% of work
ATQ,
$\frac{a}{12 \times 2} + \frac{a}{15 \times 2} = \frac{60}{100}$
$\Rightarrow \frac{5a+4a}{120} = \frac{3}{5}$
$\Rightarrow a = \frac{3}{5} \times \frac{120}{9} = 8$ days

S10. Ans.(a)
Sol.
ATQ,
$\frac{8}{24} + \frac{12}{32} + \frac{28}{x} = 1$ (where x is time taken by R to complete whole work)
$\frac{1}{3} + \frac{3}{8} + \frac{28}{x} = 1$
x = 96 days
Time taken by R to complete the whole work= 96days

S11. Ans.(a)
Sol.
Let R worked for x days
$\therefore \frac{(x+4+4)}{24} + \frac{4}{32} + \frac{x}{40} = 1$
$\Rightarrow \frac{x+8}{24} + \frac{x}{40} = \frac{7}{8}$
$\Rightarrow 5x + 40 + 3x = 105$
$\Rightarrow x = \frac{65}{8}$ days

S12. Ans. (d)
Sol. Inlet pipe can fill the tank = 4 hours
Outlet pipe can empty the tank = 30 hours
Ratio of efficing
Inlet → + 15 ⌐
Per hour work
Outlet → – 2 ⌐
To prevent overflow we required
7 more outlet piper
So outlet efficiency become = – 16 per hour

S13. Ans.(e)
Sol. Let Pipe A can fill the tank in x minutes
$\Rightarrow$ Pipe B can fill the tank in $x \times \frac{100}{150} = \frac{2x}{3}$
ATQ,
$\frac{1}{x} + \frac{3}{2x} = \frac{1}{18}$
$\Rightarrow \frac{5}{2X} = \frac{1}{18}$
$\Rightarrow$ x = 45
Capacity of tank = 45 × 6 = 270 l

S14. Ans.(c)
Sol.

A   15
          +2
B   10 +3   30
          –1
C   30
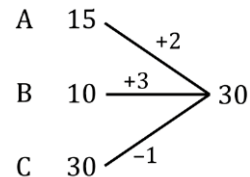
In 2 hours, part of the tank filled = 2(4) = 8 units
Now required time $= \frac{(30-8)}{5}$
$= \frac{22}{5}$
= 4hour 24mins.

S15. Ans.(b)
Sol. Let, the capacity of tank = 180 ℓ
'A' one minutes work $= \frac{180}{30} = 6$
'B' one minute work $= \frac{180}{36} = 5$
Problem occur after 'x' minutes, due to this
New efficiency of 'A' $= 6 \times \frac{5}{6} = 5$
New efficiency of 'B' $= 5 \times \frac{9}{10} = 4.5$
ATQ,
$9.5x + 11\left[\frac{33}{2} - x\right] = 180$
181.5 – 180 = 1.5x
$x = \frac{1.5}{1.5} = 1$ minutes

S1. Ans.(e)

Sol. Amount invested by Man in each Part $= \frac{9600}{2} = 4800$ Rs

ATQ -

$\frac{4800 \times 12.5 \times T}{100} + \frac{4800 \times 16 \times (T+2)}{100} = 4272$

$600T + 768T + 1536 = 4272$

$1368T = 2736$

$T = \frac{2736}{1368}$

T = 2 years

S2. Ans.(c)

Sol.

$\frac{P \times 15 \times 2}{100} + \frac{(P+800) \times 8.5 \times 2}{100} = 4836$

$\frac{30P}{100} + \frac{17P + 13600}{100} = 4836$

$47P = 483600 - 13600$

$47P = 470000$

P = 10000 Rs

Amount invested by veer at rate of 8.5% = (P + 800)

= (10000+800)

= 10800 Rs

S3. Ans.(e)

Sol. Let man invested for T year and at the rate of R% per annum

Given, $T = \frac{R}{4}$

ATQ -

$\frac{8500 \times \frac{R}{4} \times R}{100} = 1360$

$R^2 = \frac{1360 \times 4}{85}$

$R^2 = 64$

R = 8%

Time $= \frac{8}{4} = 2$ years

S4. Ans.(b)

Sol. Let Adarsh invested Rs 100x

For four years

ATQ -

$100x + \frac{100x \times R \times 4}{100} = 134x$

$4R = 34$

$R = \frac{34}{4}$

R = 8.5%

S5. Ans.(c)
Sol. Total interest at end of two years

$= \frac{12600 \times 15 \times 2}{100} = 3780$

Amount for next two years

$= 12600 + 3780 - 6380$

$= 10000$ Rs

Amount which Abhishek will pay to Satish at end of next two years

$= 10000 + \frac{10000 \times 15 \times 2}{100}$

$= 13000$ Rs

S6. Ans.(c)
Sol. Amount $-$ principal $= \frac{Principal \times Rate \times time}{100}$

$25920 - 16200 = \frac{16200 \times R \times 4}{100}$

$R = \frac{9720 \times 100}{16200 \times 4}$

$R = 15\%$

Amount $= 16200 + \frac{16200 \times 2 \times (15+5)}{100}$

$= 16200 + 6480$

$= 22680$ Rs

S7. Ans.(d)
Sol. Interest earns in C.I.

$\Rightarrow 1655 = P\left[\left(1 + \frac{10}{100}\right)^3 - 1\right]$

P = 5000

Total amount = 5000 + 1655 = 6655

Interest earn from scheme Q

$= \frac{6655 \times 8 \times 5}{100}$

$= 2662$ Rs.

S8. Ans(e)
Sol.
Let sum of money invested = X Rs.
ATQ –

$X\left(1 + \frac{r}{100}\right)^2 = 4840$ -------------------- (i)

Also,

$X\left(1 + \frac{r}{100}\right)^4 = 5856.4$ ------------------ (ii)

From $\frac{(i)^2}{(ii)}$ we get –

$X = \frac{4840 \times 4840}{5856.4}$

X = 4000 Rs.

Required amount = $4000 \times \frac{145}{100} = 5800$ Rs.

S9. Ans.(e)
Sol. Let the amount be Rs x
ATQ
$x \times \frac{30}{100} - x \times \frac{21}{100} = 432$
$x = Rs\ 4800$

S10. Ans.(e)
Sol. Let amount Sonu invested = 121x
Interest that Sonu will earn in first year = $121x \times \frac{100}{11 \times 100}$
= 11x
Interest that he will earn in second year = $11x + 11x \times \frac{1}{11} = 12x$
ATQ,
⇒ 12x = 372
⇒ x = $\frac{372}{12}$
⇒ x = 31
Hence, amount invested by Sonu = 121x = 31 × 121
121x = 3751 Rs.

S11. Ans.(a)
Sol. Let amount be Rs. P
S.I. = $\frac{P \times R \times T}{100}$ [R → rate, T → time]
$180 = \frac{P \times 5 \times 3}{100}$
P = Rs. 1200
We know,
$C.I. = P\left[\left(1 + \frac{R_1}{100}\right)\left(1 + \frac{R_2}{100}\right) - 1\right]$
$R_1 = 10\%$
$R_2 = R$
$318 = 1200\left[\left(1 + \frac{10}{100}\right)\left(1 + \frac{R}{100}\right) - 1\right]$
$\frac{318}{1200} + 1 = \left[\left(\frac{11}{10}\right)\left(1 + \frac{R}{100}\right)\right]$
$\frac{1518}{1200} = \frac{11}{10} \times \left(\frac{100+R}{100}\right)$
∴ R = 15%

S12. Ans(d)
Sol. Let Veer invested = Rs. P
So, interest get by Veer after 10 years = Rs. P
ATQ −
$P \times 10 \times R100 = P$
R = 10%
Required amount = 1600 ×1 +101003
= 1600 ×1.331
= 2129.6 Rs.

S13. Ans.(a)
Sol. Let part of sum invested at 7% = x
Then part invested at 5% = 3600 – x
ATQ,
$\Rightarrow \frac{x \times 7 \times 1}{100} + \frac{3600 - x \times 100 \times 5}{} = 204$
⇒ 7x + 18000 – 5x = 20400
⇒ x = 1200

S14. Ans.(d)
Sol. Principal = 2500
Total interest earned in 2 year
$= 2500\left[\left(1 + \frac{20}{100}\right)^2 - 1\right]$
= 1100
Interest earned in 2nd year = Two years Interest – First year Interest
= 1100 – 500
= 600
Difference between third- and second-year interest = Interest on 2nd year interest
$= 600 \times \frac{20}{100}$
= 120

S15. Ans.(e)
Sol. Let the amount be Rs x
ATQ
$x \times \frac{3}{100} - x \times \frac{2}{100} = 432$
$x = Rs$ 4800

Quiz – 18

S1. Ans.(d)
Sol. Total distance = 9 × 70 = 630
New speed = $\frac{630}{6}$ = 105 km/hr
Increase in speed = $\frac{105-70}{70} \times 100 = 50\%$

S2. Ans.(e)
Sol. Distance = 180 meter
Time = 20 second
Relative speed of train and car
$= \frac{180}{20} = 9$ m/s
Let speed of car = x m/s
So speed of train = $\frac{2}{3}x$ m/s
$x - \frac{2}{3}x = 9$ m/s
x = 27 m/s
Speed of car in km/hr = $\frac{27 \times 18}{5} = 97.2$ km/hr

S3. Ans.(b)
Sol.
ATQ,
$\frac{112}{x} = y \Rightarrow 112 = xy$
Now x and y can be written as
(2, 56) (4, 28) (8, 14) (16, 7) or
(56, 2) (28, 4) (14, 8) (7, 16)
Hence two possible co-prime pairs are possible,
i.e. (7, 16) or (16, 7)
Hence it can't be determined

S4. Ans.(b)
Sol.
Anurag's speed = $\frac{60}{10}$ = 6 km/hr
Dharam's speed = $\frac{60}{15}$ = 4 km/hr
ATQ,
Let length of race be 'D' meters.
So,
$\frac{D}{D-200} = \frac{6}{4}$
$\Rightarrow$ 2D = 1200
D = 600 m

S5. Ans.(d)
Sol.
Radius of wheel = $\frac{84}{2}$ cm = 42 cm
Distance travelled in one revolution
= $2\pi r = 2 \times \frac{22}{7} \times 42$
= 264 cm
Lets revolution made by wheel = X
So total distance travelled = distance travelled in X number of revolution
$132 = \frac{264X}{40 \times 60}$
$X = \frac{132 \times 40 \times 60}{264}$
X = 1200

S6. Ans. (d)
Sol.
In 15 seconds,
distance travelled by First car
= $15 \times 36 \times \frac{5}{18}$ = 150 m
Distance travelled by second car = $15 \times 48 \times \frac{5}{18}$ = 200
$\therefore$ Required distance = $\sqrt{(150)^2 + (200)^2}$ = 250 m

S7. Ans.(e)
Sol. Let the speed of the car be x kmph.
So, $x - 38 = \left(\frac{40+60}{20}\right) \times \frac{18}{5}$ kmph
or, $x - 38 = 18$
$\therefore x = 56$ kmph

S8. Ans.(a)
Sol. Total distance covered by Vikash =9+1=10 km.
Time taken by Vikash = 10×6
=60 min
So, time taken by Mohit = 60–4=56 min
Distance covered by Mohit = 9–1
=8 km
Speed of Mohit = $\frac{8}{56}$
=$\frac{1}{7}$ km/min.

S9. Ans.(b)
Sol. Speed of train A = $\frac{400}{16}$ = 25 m/sec
So, speed of train B = 25 m/sec
ATQ,
$\frac{400+x}{25} = 24$
$x = 200$ m
Now time required to cross platform by B
= $\frac{400+200+400}{25}$ = 40 sec

S10. Ans.(c)
Sol. Let speed of train P = 4x m/sec
Let speed of Q = 5x m/sec
$\therefore$ Length of train P = 4x × 6 = 24x m
Length of train Q = 5x × 4 = 20x m
A/Q,
$\frac{24x+480}{4x} = 18$
$\Rightarrow x = 10$
$\therefore$ Required time = $\frac{200+480}{50}$ = 13.6 sec

S11. Ans.(e)
Sol. Using formula
$D = \frac{s(s+V_1)}{V_1} \times t_1 = \frac{s(s-V_2)}{V_2} \times t_2$
Where d is distance, s is original speed and v_1, v_2 are increased and decreased speed respectively
t_1, t_2 are time decreased and increased time respectively.
$\frac{s(s+20)}{20} \times \frac{40}{60} = \frac{s(s-30)}{30} \times \frac{70}{60}$
s = 330 km/h
Distance = $330 \times \frac{(330+20)}{20} \times \frac{40}{60}$ = 3850 km

S12. Ans.(d)
Sol.
Let the length of train = x
and, the speed of train = s
ATQ,
$\frac{x+100}{12} = s = \frac{3x}{21}$
$\frac{x+100}{12} = \frac{x}{7}$
7x + 700 =12x
5x = 700
x = 140
Speed of train $= \frac{3 \times 140}{21} = 20$ m/s

S13. Ans.(c)
Sol.
Let upstream speed = x
Downstream speed = 11x
Speed of boat $= \frac{1}{2}(x + 11x) = 30$
$\Rightarrow x = \frac{30 \times 2}{12} = 5$
$\Rightarrow$ upstream speed = 5 km/hr
Distance travelled in 5 hours in upstream = 5 × 5 = 25 km

S14. Ans.(b)
Sol.
Let speed of stream = s km/hr
$\therefore (8 - s) \times 6 = (8 + s) \times 4$
$\Rightarrow 48 - 6s = 32 + 4s$
$\Rightarrow s = 1.6$ km/hr

S15. Ans.(a)
Sol.
Speed of boat in upstream = 17 kmph
Speed of river water = 3 kmph
So speed of boat in still water = 17 + 3 = 20 kmph
So speed of boat in downstream = 20 + 3 = 23 kmph

Quiz – 19

S1. Ans.(c)
Sol.
Let first term = a
Common difference = d
Sum of 10 terms $= \frac{10}{2}[2a + (10-1)d]$
Average of sum $= \frac{1}{2}[2a + (10-1)d]$

Now,

$a + \frac{112.5a}{100} = \frac{1}{2}[2a + (10-1)d]$

Solving we get, a= 4d

Sum of A.P = 85d

Second term = 5d

Required% = $\frac{5d}{85d} \times 100 = \frac{100}{17}\% = 5\frac{15}{17}\%$

S2. Ans.(b)

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

ATQ,

$\frac{2.5x}{0.75y} = \frac{8}{9}$

$\Rightarrow \frac{x}{y} = \frac{4}{15}$

S3. Ans.(a)

Sol. Let the total number of students in the university be x

Valid votes = $\frac{x \times 80}{100} - 120$

$= \frac{4x}{5} - 120$

Atq,

$\frac{3x}{8} + \left(\frac{3x}{8} - 30\right) = \frac{4x}{5} - 120$

$\Rightarrow \frac{3x}{4} - 30 = \frac{4x}{5} - 120$

$x = 1800$

No. of students who do not cast their votes= $1800 \times \frac{20}{100} = 360$

S4. Ans(d)

Sol. Let son's present age be x yrs

So, his father's present age=2x yrs

10 years ago, the ages would have been

2x -10 =3(x -10)

2x-10=3x -30

X=20 yrs

So, their present ages are 20 yrs and 40 yrs

After 15 yrs, father's and son's ages will be 55 and 35

Required ratio=$\frac{55}{35} = \frac{11}{7}$

S5. Ans(b)

Sol. Let present age of ravi and shivam be m years and n years respectively

4 years ago, m -4+ n-4= 80

m + n= 88……..(1)

Also, m-14=n-4

m – n=10………(2)

solving eqn (1) & (2), we get m=49 years and n=39 years

Present age of ravi=49 years

S6. Ans(c)
Sol. let the smallest odd number be 'a' so next odd number be 'a+2' and so on

8th number = $a + (8 - 1) \times 2 = a + 14$ (using AP, nth term = a + (n-1)d)

ATQ, $\dfrac{a+a+2+\cdots+a+14}{8} = 10$

$8a + 56 = 80$ (using sum of AP)

$a = \dfrac{80-56}{8} = 3$

Since 'a' is smallest number, so smallest 4 numbers will be = 3, 5, 7, 9

Required average = $\dfrac{3+5+7+9}{4} = 6$

S7. Ans.(d)
Sol.

Sum of ages of all the 20 members = 20 × 25 = 500

Sum of ages of first 18 members = 18 × 24 = 432

Sum of ages of last 2 members = 500 –432 = 68

∴ Average age= $\dfrac{68}{2} = 34$

S8. Ans (a)
Sol.

Profit ratio of Amit to Hemant = $\dfrac{60000\times12+68000\times12+76000\times12+84000\times12}{80000\times24}$

$= 9:5$

So, difference between their profit = $35000 \times \dfrac{9-5}{14}$

$= Rs\ 10000$

S9. Ans.(b)
Sol.

Let investment of A, B, C be 2x, 5x and 7x respectively.

Let extra amount added by 'A' after six months be Rs. y

ATQ,

2x + y = $\dfrac{1}{2}$ [5x + 7x]

2x + y = 6x

y = 4x

Ratio of profit share

A - 2x × 6 + (4x + 2x) × 6

B - 5x × 12   = 48 : 60 : 84

C - 7x × 12   = 4 : 5 : 7

B's share of profit = Rs 4250

⇒ 5 → 4250

⇒ 1 → 850

⇒ (4 + 5 + 7) =16 → 16 × 850 = 13600

Total profit = Rs. 13600.

S10. Ans.(e)

Sol. Let, total quantity = 100ℓ

Quantity of milk = 60 ℓ

And quantity of milk = 40 ℓ

ATQ,

$\frac{40}{100} = \frac{60}{100+x}$

2 (100 + x) = 5 × 60

200 + 2x = 300

2x = 100

x = 50 ℓ

Water added in % $= \frac{50}{100} \times 100$

= 50%

S11. Ans.(e)

Sol.

SI for 2 years $= \frac{450}{3} \times 2 = 300$

And, S.I for 1 year $= \frac{450}{3} = 150 = \frac{PR}{100}$

CI for 2 years = 309

$CI_2 - SI_2$ = Rs. 9

Difference between C.I and S.I for 2 years $= \frac{PR^2}{100^2} = 9$

$\frac{PR \times R}{100} = 900$

$\Rightarrow R = \frac{900}{150} = 6\%$

$CI_2 - SI_2 = P\left(\frac{R}{100}\right)^2$

$9 = P\left(\frac{6}{100}\right)^2$

P = Rs. 2500

S12. Ans.(b)

Sol.

Let speed of stream = r km/h

A/q,

$(8 - r) \times 5 = (8 + r) \times 3$

$\Rightarrow$ 40 – 5r = 24 + 3r

$\Rightarrow r = \frac{16}{8} = 2 \, km/h$

S13. Ans.(c)

Sol.

We know work efficiency ratio of A to B = 5 : 4

Let time taken by A alone to complete the work = 4x

And by B to complete the work alone = 5x

Atq,

5x – 4x = 6

$\Rightarrow$ x = 6

So, A alone can complete the work in 24 day

And, B alone can complete the work in 30 day

A and B working together can complete the work in

$$= \frac{1}{\frac{1}{30}+\frac{1}{24}} = \frac{120}{9} = 13\frac{1}{3} \text{ days}$$

S14. Ans. (b)

Sol.

Speed = $\frac{\text{Distance}}{\text{Time}}$

Total Distance = Length of bridge + Length of train

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

Speed = $\frac{\frac{3}{2}}{2\times\frac{1}{60}} = \frac{3}{4} \times 60 = 45$ kmph

S15. Ans.(e)

Sol.

Let the amount be Rs x

ATQ

$x \times \frac{30}{100} - x \times \frac{21}{100} = 432$

$x = Rs$ 4800

Quiz – 20

S1. Ans.(c)

Sol.

Let, C.P. of table = x

Person Sells table at a profit of 10%

⇒ S.P. = 1.1x

ATQ,

$\frac{120}{100}\left[\frac{95}{100}\right] \times x = 1.1x + 80$

1.14x – 1.1x = 80

0.04x = 80

x = 2,000

S2. Ans.(c)

Sol.

1st C.P. → 12000 Rs.

1st S.P. → $\frac{12000\times80}{100}$ = 9600 Rs.

Now,

2nd C.P. → 9600 Rs.

2nd S.P. → $\frac{9600\times130}{100}$ = 12480 Rs.

Profit ⇒ 480 Rs.

S3. Ans.(e)
Sol.
Let selling C.P. of bike → 100
Old S.P. → 118
New S.P. after 10% increase → 118 + 11.8 → 129.8
Profit increase = (129.8 – 118)units ⇒ 295
11.8 units⇒ 295
1 unit⇒ 25
New S.P. ⇒ 25 × 129.8 = 3245 Rs.

S4. Ans(e)
Sol.
Given, cost price of pen = x Rs. And SP= Rs 128
ATQ –
$x \left(1 + \frac{(x-20)}{100} \right) = 128$
$100x + x^2 - 20x = 12800$
$x^2 + 80x - 12800 = 0$
$x^2 + 160x - 80x - 12800 = 0$
$x(x + 160) - 80(x + 160)$
x = 80 Rs.
For 40% profit Veer should sold the pen = $80 \times \frac{140}{100} = 112\ Rs.$

S5. Ans(b)
Sol.
Let cost price of shirt = 100x
So, cost price of jeans = 132.5x
New cost price of jeans = 132.5x × 1.3 = 172.25x
Selling price of jeans = 172.25x × 1.25 = 215.3125x
Cost price of jeans = 4134 $\times \frac{132.5x}{215.3125x}$
= 2544 Rs.
Cost price of shirt = 2544 $\times \frac{100x}{132.5x}$ = 1920 Rs.
Marked price of shirt = 1920 $\times \frac{115}{100}$ = 2208 $Rs.$
Alternate
Let cost price of jeans = $53x$
So, cost price of shirt = $40x$
New cost price of jeans = $53x \times 1.3 = 68.9x$
Selling price of jeans = $68.9x \times 1.25$
So, $4134 = 68.9x \times 1.25$
$x = 48$
Cost price of shirt = 40× 48 = 1920 $Rs.$
Marked price of shirt = 1920 $\times \frac{115}{100} = 2208\ Rs.$

S6. Ans.(a)

Sol. Let market price = 10x

Then selling price will be = $10x \times \frac{90}{100}$

= 9x

Cost price will be = $\frac{9x \times 100}{108}$

= $\frac{25x}{3}$

According to question market price will be of 4 article and cost price will be of 5 article.

Required percentage = $\frac{\frac{10x}{4}}{\frac{25x}{3 \times 5}} \times 100$

= $\frac{10x \times 3 \times 5}{25x \times 4} \times 100$

= 150%

S7. Ans(a)

Sol.

Total cost price of quantity of tomatoes seller had = $230 \times 10 \times 100 = 230000$ Rs.

So, total selling price of quantity of tomatoes seller had, if he had to gain 15% profit = $230000 \times \frac{115}{100} = 264500\ Rs.$

Total quantity of tomatoes available for selling = $230 \times \frac{80}{100} = 184$ quintals

Total selling price of half of 184 quintals of tomatoes which seller sold at Rs. 20 per kg = $184 \times \frac{1}{2} \times 20 \times 100 = 184000\ Rs.$

So, seller had to sell the remaining tomatoes = $\frac{264500 - 184000}{92} \times \frac{1}{100}$

= $8.75\ Rs./kg$

S8. Ans.(b)

Sol.

Volume of cylinder = Volume of 'x' cubes

$\frac{22}{7} \times 14 \times 14 \times 196 = x \times 7^3$

$\Rightarrow x = 352$

S9. Ans.(d)

Sol.

Let radius of smaller & larger circles be r_1 & r_2 respectively.

$2\pi\, r_1 = 132$

$r_1 = 21$ m

$2\pi\, r_2 = 176 \Rightarrow r_2 = 28$ m.

$\therefore$ Required difference

$$= \pi(r_2^2 - r_1^2)$$

$$= \frac{22}{7} \times 49 \times 7$$

= 1078 m^2

S10. Ans.(d)
Sol.
Curved surface area of cone = $\pi r \ell$ = 1.76 m^2

$$\frac{22}{7} \times 70 \times \ell = 17600$$

$\ell = 80$

$$\text{Height of cone} = \sqrt{80^2 - 70^2}$$
$$= \sqrt{6400 - 4900}$$
$$= \sqrt{1500} = 10\sqrt{15} \text{ cm}$$

S11. Ans.(d)
Sol.
Required probability = $\frac{^4C_2}{^7C_2}$

$= \frac{4 \times 3}{7 \times 6}$

$= \frac{2}{7}$

S12. Ans.(a)
Sol.
Required probability = $\frac{^5C_1 \times {}^7C_1 + {}^7C_2 \times {}^5C_0}{^{12}C_2}$

$= \frac{35 + 21}{66} = \frac{56}{66} = \frac{28}{33}$

S13. Ans.(c)
Sol. Favorable cases = (1, 3, 5) = 3
Possible cases = 6
∴ Required probability = $\frac{3}{6} = \frac{1}{2}$

S14. Ans.(c)
Sol. Total number formed = 6 × 5 × 4 × 3 × 2 = 720

S15. Ans.(a)
Sol.
No. of ways $= 7_{C_5} \times 3_{C_2} = \frac{7 \times 6}{2 \times 1} \times 3 = 63$

Quiz – 21

S1. Ans.(a)
Sol.
Required total
$\frac{3}{4} \times 32 + \frac{3}{7} \times 35$
=24+15=39 lakhs

S2. Ans.(c)
Sol. Required ratio

$$\frac{\frac{1}{6} \times 24 + \frac{1}{3} \times 12}{\frac{3}{7} \times 28 + \frac{3}{8} \times 16}$$

$$\frac{4+4}{12+6} = \frac{8}{18} = 4:9$$

S3. Ans.(b)
Sol. Male in M.P. in year 2011
$\frac{4}{9} \times 18 = 8 lakhs$
Required difference
$\frac{1}{8} \times 8 = 1 lakh$

S4. Ans.(d)
Sol. Required percentage

$$\frac{\frac{4}{7} \times 28 - \frac{5}{8} \times 16}{\frac{4}{7} \times 28} \times 100 = \frac{16-10}{16} \times 100 = \frac{600}{16} = 37.5\%$$

S5. Ans.(e)
Sol. 24% of males of state A.P. in year 2012
$= \frac{24}{100} \times \frac{4}{5} \times 25,00,000$
$=4,80,000$
∴Required percentage $= \frac{4,80,000}{35,00,000} \times 100 = 13.71\%$

S6. Ans.(b)
Sol. Number of watches sold by shopkeeper P
$= \frac{484}{22} \times 34$
$= 748$
Number of shocks sold by shopkeeper T
$= 1550$
∴ Required difference = 1550 – 748
= 802

S7. Ans.(a)
Sol. No. of watch & shoes sold by Q
$= \frac{2304}{24}[48 + 28]$
$= \frac{2304}{24}[76]$
$= 96 \times 76$
No. of watches & shoes sold by S
$= \frac{1280}{40} \times 60$
$= 32 \times 60$
Required ratio $= \frac{96 \times 76}{32 \times 60} = \frac{19}{5}$

S8. Ans.(c)
Sol.
No. of shoes sold by shopkeeper T
$= \frac{1550}{25} \times 60$
$= 62 \times 60 = 3720$
$\therefore$ Shoes sold by T which are not defective
$= \frac{1}{5} \times 3720 = 744$

S9. Ans.(b)
Sol.
Total product sold by shopkeeper S
$= 100 \times \frac{1280}{(100-60)} = 3200$
Total product sold by shopkeeper R
$= 100 \times \frac{1040}{(100-80)} = 5200$
$\therefore$ Required percentage
$= \frac{2000}{5200} \times 100$
$\simeq 38\%$

S10. Ans.(e)
Sol.
Watches & shocks sold by R
$= 1040 + \frac{1040}{20} \times 13$
$= 1040 + 676 = 1716$
Watches and shoes sold by P
$= \frac{484}{22} \times 78 = 1716$
Required % $= \frac{1716}{1716} \times 100 = 100\%$

S11. Ans.(e)
Sol.
Total no. of male students learning Indian Classical in schools P and S together
$= \frac{5}{8} \times \frac{40}{100} \times 400 + \frac{3}{4} \times \frac{16}{100} \times 375$
$= 145$
And total female students learning Indian Classical in same schools together
$= \frac{3}{8} \times \frac{40}{100} \times 400 + \frac{1}{4} \times \frac{16}{100} \times 375$
$= 75$
$\therefore$ Required ratio $= \frac{145}{75}$
$= \frac{29}{15}$

S12. Ans.(d)
Sol.
Total students who are below 17 years from Q

$$= \frac{1}{9} \times \frac{24}{100} \times 225$$

= 6

∴ Females who are below 17 years

$$= \frac{1}{2} \times 6 = 3$$

∴ Required no. of females (≥ 17 years) = 18-3=15

S13. Ans.(c)
Sol.
Required difference

$$= \frac{1}{3} \times \frac{24}{100} \times 225 + \frac{3}{5} \times \frac{20}{100} \times 525$$

= 18 + 63

= 81

S14. Ans.(b)
Sol.
Required average

$$= \frac{1}{3} \times \left(\frac{60}{100} \times 400 + \frac{76}{100} \times 225 + \frac{80}{100} \times 525 \right)$$

$$= \frac{1}{3} \times (240 + 171 + 420)$$

= 277

S15. Ans.(d)
Sol.
Total students in Q and S together

$$= \frac{24}{100} \times 225 + \frac{16}{100} \times 375$$

= 114

Total students in P and R together

$$= \frac{40}{100} \times 400 + \frac{20}{100} \times 525$$

= 265

∴ Required percentage

$$\frac{265-114}{265} \times 100$$

≃ 57%

S1. Ans.(c)
Sol.
Required difference
$= \frac{(17+24)-(18+16)}{100} \times 33000$
$= (41- 34) \times 330$
$= 2310$

S2. Ans.(e)
Sol.
Required difference$= \frac{[43-(100-34-43)]}{100} \times \frac{17}{100} \times 33000$
$= \frac{20}{100} \times \frac{17}{100} \times 33000$
$= 1122$

S3. Ans.(a)
Sol.
Required percentage
$= \frac{(12+17-16)}{16} \times 100$
$= \frac{13}{16} \times 100$
$= 81.25\%$

S4. Ans.(b)
Sol.
Average population of A, C & Y $= \frac{18+16+17}{3}$
$= 17\%$
Average population of B & X $= \frac{24+12}{2}$
$= 18\%$
Required difference
$= \frac{(18-17)}{100} \times 33000$
$= 330$

S5. Ans.(d)
Sol.
Population of city C not doing govt. Job
$= \frac{(40+30)}{100} \times \frac{16}{100} \times 33000$
$= \frac{70}{100} \times \frac{16}{100} \times 33000$
$= 3696$

S6. Ans(a)
Sol. no. of valid votes cast in village B $= 10000 \times \frac{25}{100} \times \frac{80}{100} \times \frac{90}{100} = 1800$

S7. Ans(d)

Sol. total valid votes cast in village C = $10000 \times \frac{20}{100} \times \frac{90}{100} = 1800$

Let winning candidate got x% of votes cast and Losing Candidate got (x-12)% of votes cast.

Now, ATQ

$x + x - 12 = 100$

$x = 56\%$

Votes obtained by losing candidate = $\frac{44}{100} \times 1800 = 792$

S8. Ans(e)

Sol. average registered voters of B,C,D = $\frac{(25+20+15)}{100} \times \frac{10000}{3} = 2000$

S9. Ans(c)

Sol. votes cast -

A = $10000 \times \frac{20}{100} \times \frac{70}{100} = 1400$

B = $10000 \times \frac{25}{100} \times \frac{65}{100} = 1625$

D = $10000 \times \frac{15}{100} \times \frac{80}{100} = 1200$

E = $10000 \times \frac{20}{100} \times \frac{75}{100} = 1500$

Maximum voters cast their votes in village B.

S10. Ans(b)

Sol. average number of registered voters from village A & C = $\frac{10000}{2} \times \frac{20+20}{100} = 2000$

Average no. of registered voters from village B, D & E = $\frac{10000}{3} \times \frac{(25+15+20)}{100} = 2000$

Required % = $\frac{2000}{2000} \times 100 = 100\%$

S11. Ans(d)

Sol. total watches manufactured by Casio, Titan & Sonata = $\frac{20+15+25}{100} \times 1000 = 600$

required average = $\frac{600}{3} = 200$

S12. Ans(c)

Sol. required ratio = $\frac{10+25}{100} \times 1000 : \frac{20+20}{100} \times 1000 = 7:8$

S13. Ans(b)

Sol. watches manufactured of Sonata = $\frac{25}{100} \times 1000 = 250$

Watches manufactured of Rado = $\frac{10}{100} \times 1000 = 100$

Required % = $\frac{250-100}{100} \times 100 = 150\%$

S14. Ans(e)

Sol. in next year

No. of Titan watches manufactured = $\frac{110}{100} \times \frac{15}{100} \times 1000 = 165$

No. of Timex watches manufactured = $\frac{90}{100} \times \frac{10}{100} \times 1000 = 90$

Required difference = $165 - 90 = 75$

S15. Ans(b)

Sol. Average no. of watches manufactured = $\frac{1000}{6}$ = 166.67

Watches manufactured

Casio = $\frac{20}{100} \times 1000 = 200$

Titan = $\frac{15}{100} \times 1000 = 150$

Sonata = $\frac{25}{100} \times 1000 = 250$

Timex = $\frac{10}{100} \times 1000 = 100$

Fossil = $\frac{20}{100} \times 1000 = 200$

Rado = $\frac{10}{100} \times 1000 = 100$

Required answer = Casio, Sonata, Fossil = 3

Quiz – 23

S1. Ans(d)

Sol. required difference = average marks scored by Student A - Average marks scored by Student B

∴ $\frac{70+90+60+55}{4} - \frac{50+80+75+65}{4} = \frac{5}{4} = 1.25$

S2. Ans(c)

Sol. marks obtained by student A in Math and Computer together =70 + 90 = 160

marks obtained by student B in Science and English together=75+65 =140

required ratio = 160:140= 8:7

S3. Ans(b)

Sol. Overall percentage marks of Student B = $\frac{50+80+75+65}{400} \times 100 = 67.5$

S4. Ans(c)

Sol. Marks Scored by Student A in Math =70

Marks Scored by Student B in Science and English =75+65=140

Required % = $\frac{70}{140} \times 100 = 50$

S5. Ans(b)

Sol. A.T.Q, passing marks =$\frac{40}{100} \times 120 = 48$

∴ required difference = 80 – 48 = 32

S6. Ans(c)

Sol. amount received by Rohit = $4000 + \frac{4000 \times 10 \times 2}{100} = Rs.\,4800$

S7. Ans(e)

Sol. interest amount received by Karan = $\frac{8000 \times 10 \times 2}{100} = Rs.\,1600$

Interest amount received by Mahesh = $\frac{6000 \times 12 \times 4}{100} = Rs.\,2880$

Required % = $\frac{2880 - 1600}{1600} \times 100 = 80\%$

S8. Ans(d)

Sol. total interest amount received by Anurag & Rohit together $= \frac{4000 \times 16 \times 4}{100} + \frac{4000 \times 10 \times 2}{100} = Rs.\,3360$

S9. Ans(a)

Sol. interest received by Karan (SI) $= \frac{8000 \times 10 \times 2}{100} = Rs.\,1600$

Interest received by Karan (CI) $= 8000 \left(1 + \frac{10}{100}\right)^2 - 8000 = Rs.\,1680$

Required value $= 1680 - 1600 = Rs.\,80$

S10. Ans(e)

Sol.

Interest received by Karan $= \frac{8000 \times 10 \times 2}{100} = Rs.\,1600$

Interest received by Anurag $= \frac{4000 \times 16 \times 4}{100} = Rs.\,2560$

Interest received by Mahesh $= \frac{6000 \times 12 \times 4}{100} = Rs.\,2880$

Interest received by Rohit $= \frac{4000 \times 10 \times 2}{100} = Rs.\,800$

Clearly, Mahesh had received highest interest

S11. Ans(b)

Sol.

Number of Honda city car sold in Ahmedabad=320

Number of Innova car sold in Surat=480

Required percentage$=\frac{320}{480} \times 100 = 66\frac{2}{3}\%$

S12. Ans(d)

Sol. Total creta car sold in Delhi and Mohali together=420+280=700

Total innova car sold in Kolkata and Ahmedabad together=320+500=820

Required ratio$= \frac{700}{820}$ =35:41

S13. Ans(a)

Sol. total number of cars sold in Kolkata=320+360+460=1140

S14. Ans(e)

Sol. Total number of Honda city cars sold in delhi=540

Total number of creta cars sold in surat=450

Required difference=540 -450=90

S15. Ans(c)

Sol. Total number of Honda city car sold in all the cities together=460+320+340+540+420=2080

Average$=\frac{2080}{5}$=416

Quiz – 24

S1. Ans.(b)
Sol. Total rooms booked in Oberai on Tuesday and Thursday = 280 + 520 = 800
Total rooms books in Grand on Monday and Thursday = 280 + 720 = 1000
Required percentage = $\frac{1000-800}{1000} \times 100 = 20\%$

S2. Ans.(d)
Sol. Total rooms booked in Oberai, Lodhi and Taj on Monday
= 360 + 260 + 640 = 1260
Total rooms booked in Taj, Grand and Eros on Thursday
= 375 + 720 + 275 = 1370
Required difference = 1370 – 1260 = 110

S3. Ans.(a)
Sol.
Total room booked in Eros on Wednesday and Thursday = 265 + 275 = 540
Total rooms booked in Lodhi on Thursday and Friday = 215 + 305 = 520
Required ratio = 540 : 520
= 27 : 26

S4. Ans.(c)
Sol.
Average of room booked in Eros on Monday, Wednesday and Friday
= $\frac{155+265+315}{3}$
= 245
Average of room booked in 'Grand' on Monday & Friday
= $\frac{280+220}{2}$
= 250
Required sum = 245 + 250 = 495

S5. Ans.(e)
Sol.
Required percent = $\frac{480-360}{360} \times 100 = 33\frac{1}{3}\%$

S6. Ans.(c)
Sol.
Required difference = $\frac{(16-12)}{100} \times 45000 = 1800$

S7. Ans.(a)
Sol.
Required average = $\frac{1}{3} \times (24 + 8 + 4) \times 450 = 5400$

S8. Ans.(d)

Sol. Required percentage = $\frac{36-24}{24} \times 100 = 50\%$

S9. Ans.(b)

Sol. No. of candidates who are males who are selected from Etawah

$= \frac{12}{100} \times \frac{80}{100} \times 45000$

$= 4,320$

S10. Ans.(a)

Sol. Required percentage = $\frac{8}{24} \times 100 = 33\frac{1}{3}\%$

S11. Ans.(a)

Sol. Required percentage = $\frac{45}{75} \times 100 = 60\%$

S12. Ans.(b)

Sol. Required average = $\frac{1}{5} \times (64 + 60 + 72 + 40 + 84)$

$= \frac{1}{5} \times 320$

$= 64$

S13. Ans.(c)

Sol. Required ratio = $\frac{(80+60)}{(60+40)}$

$= \frac{140}{100} = \frac{7}{5}$

S14. Ans.(d)

Sol. Required difference

$= (60 + 80 + 45 + 75 + 90) -(64 + 60 + 72 + 40 + 84)$

$= 350 - 320$

$= 30$

S15. Ans.(b)

Sol. Required percentage = $\frac{90-84}{90} \times 100$

$= \frac{100}{15} = \frac{20}{3}\% = 6\frac{2}{3}\%$

Quiz – 25

S1. Ans.(c)

Sol.

Let total production of the company be x

$\therefore$ Required percent = $\frac{(.30x-0.10x)}{0.30x} \times 100$

$= \frac{2}{3} \times 100 = 66\frac{2}{3}\%$ less

S2. Ans.(a)
Sol.
Required difference = 30% of 1,20,000 – 20% of 1,20,000
= 12000

S3. Ans.(e)
Sol.
Let total production be x
Required ratio $= \frac{40\% \text{ of } x}{10\% \text{ of } x} = 4 : 1$

S4. Ans.(d)
Sol.
Let total production be x
ATQ,
10% of x = 15000
$\frac{x}{10} = 15000$
x = 1,50,000
Required average $= \frac{10\% \text{ of } 1,50,000 + 50\% \text{ of } 1,50,000}{2}$
$= \frac{15000 + 75000}{2} = 45000$

S5. Ans.(b)
Sol. Let total production of each previous years be x
$\therefore \frac{30}{100} x = 12000$
x = 40000
Total production in 2018 $= \frac{110}{100} \times 40000$
= 44000.

S6. Ans.(a)
Sol.
Total markers sold by Deepak = 450 + 650 + 550 = 1650
Total markers sold by Inder = 800 + 750 + 650
= 2200
Required % $= \frac{2200 - 1650}{2200} \times 100$
$= \frac{550}{2200} \times 100$
= 25%

S7. Ans.(d)
Sol. 'Y' markers sold by all the fives sellers = 650 + 500 + 500 + 900 + 750 = 3300
'Z' marker sold by all the five sellers = 550 + 700 + 600 + 750 + 650 = 3250
Required ratio $= \frac{3300}{3250} = \frac{66}{65}$

S8. Ans.(b)

Sol. Average number of marker sold by Yogesh $= \frac{600+500+700}{3} = 600$

Average number of marker sold by Aman $= \frac{400+500+600}{3} = 500$

Required difference = 600 – 500 = 100

S9. Ans.(e)

Sol.

'X' type marker sold by Yogesh, Shubham and Aman together = 600 + 750 + 400 = 1750

'Z' type marker sold by Yogesh, Shubham and Inder together = 700 + 750 + 650 = 2100

Required % $= \frac{2100-1750}{2100} \times 100$

$= 16\frac{2}{3}\%$

S10. Ans.(c)

Sol. Required difference

= (450 + 650 + 550 + 600 + 500 + 700 + 400 + 500 + 600) – (750 + 900 + 750 + 800 + 750 + 650)

= 4950 – 4600 = 350

S11. Ans.(b)

Sol.

Total number of students registered for CGL

= 25 + 35 + 40 + 55 + 45

= 200

Total number of students registered for CHSL

= 20 + 30 + 35 + 45 + 20

= 150

$$\text{Required\%} = \frac{200-150}{150} \times 100$$

$= \frac{50}{150} \times 100 = 33\frac{1}{3}\%$

S12. Ans.(e)

Sol.

Total students registered for all the three exams in 2012 and 2013 together

= 15 + 25 + 20 + 25 + 35 + 30

= 150

Total students registered for all the three exams in 2014 and 2015 together

= 35 + 40 + 35 + 45 + 55 + 45

= 255

Required ratio $= \frac{150}{255} = \frac{10}{17}$

S13. Ans.(c)

Sol.

Average number of students registered for MTS exam

$= \frac{15+25+35+45+40}{5} = \frac{160}{5} = 32$

Average number of students registered for CHSL exam

$$= \frac{20+30+35+45+20}{5}$$

$$= \frac{150}{5} = 30$$

Required difference = 32 – 30 = 2

S14. Ans.(a)
Sol.
Total students registered for all the three exams in 2016
= 40 + 45 + 20
= 105
Number of appeared students
$$= \frac{80}{100} \times 105$$
= 84
Students appeared for MTS exam
$$= \frac{84}{7} \times 3$$
= 36
Required % $= \frac{36}{40} \times 100 = 90\%$

S15. Ans.(d)
Sol.
Total number of students register for all exams
= 25 + 35 + 30
= 90 Lakh
Required number of students
$= 90 \times \frac{80}{100} \times \frac{75}{100} = 54$ Lakh

Quiz – 26

S1.Ans(a)
Sol. Total 8 GB mobile phones sold by A = $(4000 + 3000) \times \frac{40}{100} - 4000 \times \frac{45}{100} = 1000$
Total 8 GB mobile phones sold by B = $(6000 + 4000) \times \frac{80}{100} - 6000 \times \frac{2}{3} = 4000$
Required percentage = $\frac{(1000+4000)}{10000} \times 100 = 50\%$

S2.Ans(c)
Sol.
Total unsold mobiles by B & C = $(6000 + 4000) \times \frac{20}{100} + (5000 + 4000) \times \frac{40}{100}$
= 2000 + 3600 = 5600
Average = $\frac{5600}{2} = 2800$
Total sold mobiles by C = $(5000 + 4000) \times \frac{60}{100} = 5400$
Required difference = $5400 - 2800 = 2600$

S3. Ans(d)
Sol.

Total 8GB mobiles sold by A = $(4000 + 3000) \times \frac{40}{100} \times \frac{2}{7} = 800$

Total 8GB mobiles sold by C = $(5000 + 4000) \times \frac{60}{100} \times \frac{4}{9} = 2400$

Required sum = 800 + 2400 = 3200

S4. Ans(a)
Sol.

Total unsold mobiles by A = $(4000 + 3000) \times \frac{60}{100} = 4200$

Total unsold mobiles by B = $(6000 + 4000) \times \frac{20}{100} = 2000$

Required percentage = $\frac{4200 - 2000}{2000} \times 100 = 110\%$

S5. Ans(d)
Sol.

Total sold mobiles by A = $(4000 + 3000) \times \frac{40}{100} = 2800$

Total sold mobiles by B = $(6000 + 4000) \times \frac{80}{100} = 8000$

Total sold mobiles by C = $(5000 + 4000) \times \frac{60}{100} = 5400$

Required average = $\frac{2800 + 8000 + 5400}{3}$

$= \frac{16200}{3} = 5400$

S6. Ans(c)
Sol.

Total complains unresolved in police stations A = $9600 \times \frac{75}{100} = 7200$

Total complains unresolved in police stations C = $4800 \times \frac{85}{100} = 4080$

Total complains unresolved in police stations E = $8000 \times \frac{60}{100} = 4800$

Required average = $\frac{7200 + 4080 + 4800}{3}$

= 5360

S7. Ans(d)
Sol.

Total complain resolved in police station B = $8400 \times \frac{30}{100} = 2520$

Total complain resolved in police station A & D = $9600 \times \frac{25}{100} + 6400 \times \frac{1}{8}$

= 2400 + 800

= 3200

Required percentage = $\frac{3200 - 2520}{3200} \times 100$

$= \frac{680}{3200} \times 100$

= 21. 25%

S8. Ans(a)

Sol. Total number of complains resolved in police stations B & E

$= = 8400 \times \frac{30}{100} + 8000 \times \frac{40}{100}$

= 2520 + 3200

= 5720

Total complains unresolved in police station C = $4800 \times \frac{85}{100} = 4080$

Required difference = 5720 − 4080

= 1640

S9. Ans(b)

Sol. Total complains resolved in police stations A & D = $9600 \times \frac{25}{100} + 6400 \times \frac{1}{8}$

= 2400 + 800

= 3200

Total complains unresolved in police station B = $8400 \times \frac{70}{100} = 5880$

Required ratio = $\frac{3200}{5880}$

= 80 : 147

S10. Ans(b)

Sol.

Total complains unresolved in police station B = $8400 \times \frac{70}{100} = 5880$

Total complains unresolved in police station E = $8000 \times \frac{60}{100} = 4800$

Required percentage = $\frac{5880-4800}{4800} \times 100$

$= \frac{1080}{4800} \times 100$

= 22.5%

S11. Ans. (c)

Sol. Number of Activa in A & B together in 2019 = $\left(6000 \times \frac{100-50}{100}\right) + \left(4000 \times \frac{100-25}{100}\right)$

= 3000 + 3000

= 6000

Number of Activa in D & E together in 2018 = $\left(8000 \times \frac{100-25}{100}\right) + \left(5000 \times \frac{100-20}{100}\right)$

= 6000 + 4000

= 10000

Required % = $\frac{6000}{10000} \times 100$

= 60%

S12. Ans. (b)

Sol. Average number of aviators in C, D & E in 2018 = $\frac{1}{3} \times \left(\left(6000 \times \frac{30}{100}\right) + \left(8000 \times \frac{25}{100}\right) + \right.$

$\left.\left(5000 \times \frac{20}{100}\right)\right)$

$= \frac{1}{3} \times (1800 + 2000 + 1000)$

= 1600

Average number of aviators in A & D in 2019 = $\frac{1}{2} \times \left(\left(6000 \times \frac{50}{100}\right) + \left(10000 \times \frac{20}{100}\right) \right)$

$= \frac{1}{2} \times (3000 + 2000)$

$= 2500$

Required difference = $2500 - 1600$

$= 900$

S13. Ans. (e)

Sol. Number of Activa in A, B & C together in 2018 = $\left(\left(3000 \times \frac{100-40}{100}\right) + \left(2000 \times \frac{100-50}{100}\right) + \right.$

$\left. \left(6000 \times \frac{100-30}{100}\right) \right)$

$= 1800 + 1000 + 4200$

$= 7000$

S14. Ans. (d)

Sol. Number of Avaitor in C & E together in 2019 = $\left(\left(9000 \times \frac{40}{100}\right) + \left(8000 \times \frac{60}{100}\right) \right)$

$= 3600 + 4800$

$= 8400$

Number of Activa in D & E together in 2019 = $\left(\left(10000 \times \frac{100-20}{100}\right) + \left(8000 \times \frac{100-60}{100}\right) \right)$

$= 8000 + 3200$

$= 11200$

Required % $= \frac{11200-8400}{11200} \times 100$

$= 25\%$

S15. Ans. (a)

Sol. Required number of Avaitor = $\left(3000 \times \frac{40}{100}\right) + \left(2000 \times \frac{50}{100}\right)$

$= 1200 + 1000$

$= 2200$

Quiz – 27

Sol. (1−5):

Let total players in Asia = a

And, total players in Europe = b

Total players in Crown in Asia = $a \times \frac{75}{4} \times \frac{1}{100} = \frac{3a}{16}$

Total players in Gold in Europe = $b \times \frac{200}{7} \times \frac{1}{100} = \frac{2b}{7}$

Given, $\frac{3a}{16} + \frac{2b}{7} = 210$ -------------------- (i)

And $a + b = 900$ -----------------------(ii)

So, from (i) and (ii),

Total players in Asia = 480

And total players in Europe = 420

Total players in Crown in Europe = $\frac{400}{21} \times \frac{1}{100} \times 420 = 80$

Total players in Platinum in Asia = $\frac{1}{2} \times 480 = 240$

Now, total players in Gold in Asia = $480 - \frac{3}{16} \times 480 - 240 = 150$

And total players in Platinum in Europe= $420 - \frac{2}{7} \times 420 - 80 = 220$

Levels	Asia	Europe
Platinum	240	220
Crown	90	80
Gold	150	120
Total	480	420

S1. Ans(d)
Sol.
Required percentage = $\frac{240 - 120}{120} \times 100$
= 100%

S2. Ans(a)
Sol.
Required ratio = $\frac{80}{150}$
= 8 : 15

S3. Ans(e)
Sol.
Total players in Platinum & Crown in 'Middle east' = $360 - 80 \times \frac{125}{100} = 260$
Required difference = (240 + 90) – 260 = 70

S4. Ans(b)
Sol
Required average = $\frac{150+120}{2}$
= $\frac{270}{2}$ = 135

S5. Ans(c)
Sol. boys in platinum from both servers = $240 \times \frac{5}{8} + 220 \times \frac{7}{11}$
= 150 + 140
= 290

Sol (6-10):

Let amount invested by A be Rs.100x.

So, amount invested by B = $\frac{150}{100} \times 100x$ = Rs.150x

And, amount invested by D = $100x \times \frac{100}{80}$ = Rs.125x

Now, amount invested by C = $\frac{40}{100} \times 125x$

= Rs.50x

And, amount invested by E = $50x \times \frac{4}{1}$

= Rs.200x

ATQ,

$\frac{100x+200x}{2}$ = 30,000

$x = 200$

Person	Amount invested (in Rs.)
A	20,000
B	30,000
C	10,000
D	25,000
E	40,000

S6. Ans. (b)
Sol. Required amount = 30,000 + 10,000
= Rs.40,000

S7. Ans. (c)
Sol. Required average = $\frac{10,000+25,000+40,000}{3}$
= Rs.25,000

S8. Ans. (a)
Sol. Required interest = $\frac{\left(\frac{60}{100} \times 25,000\right) \times 12 \times 2}{100}$
= Rs.3,600

S9. Ans. (e)
Sol. Required ratio = $\frac{20,000+30,000}{10,000+40,000}$
= 1:1

S10. Ans. (b)
Sol. Required amount = $30,000 \times \left(1 + \frac{20}{100}\right)^2$
= Rs.43,200

Sol.(11-15)
Let the total work = 108 unit (LCM of 36 & 54)

So, the efficiency of Veer = $\frac{108}{36}$ = 3 $unit/day$

The efficiency of Ayush = $\frac{108}{54}$ = 2 $unit/day$

Now, the efficiency of Shivam = $3 \times \frac{100-50}{100}$ = 1.5 unit/day

So, time taken by shivam to complete same work alone = $\frac{108}{1.5}$ = 72 $days$

So, time taken by Anurag to complete same work alone = 72 – 45 = 27 days.

Efficiency of Anurag = $\frac{108}{27}$ = 4 unit/day

S11. Ans. (b)
Sol. Required days = 72 days.

S12. Ans. (d)
Sol.
Required days = $\frac{108}{(4+2)}$ = 18 days.

S13. Ans. (b)
Sol.
Required ratio = 3 : 4

S14. Ans. (e)
Sol.
We know wage are given in the ratio of their efficiency.

So, wage share of Anurag = $21000 \times \frac{4}{3+2+1.5+4}$ = Rs.8000

S15. Ans. (b)
Sol.
Efficiency of Deepak = $\frac{75}{100} \times 4 = 3$ $unit/day$

Required days = $\frac{2 \times 108}{3}$ = 72 days.

Quiz – 28

S1. Ans (c)
Sol. required ratio = $\frac{7500}{5000 \times \frac{50}{100}}$ = $\frac{7500}{2500}$

= 3 : 1

S2. Ans (d)
Sol. average of passed students from school A and C = $\frac{6000 \times \frac{70}{100} + 8000 \times \frac{60}{100}}{2}$

= $\frac{4200 + 4800}{2}$ = 4500

So, required difference = $7500 - 4500 = 3000$

S3. Ans (b)

Sol. required percentage $= \frac{8000 \times \frac{40}{100}}{6000 \times \frac{80}{100}} \times 100 = \frac{3200}{4800} \times 100$

$= \frac{200}{3}\% = 66\frac{2}{3}\%$

S4. Ans (a)

Sol. From graph it is clearly visible that the maximum no. of students passed in school B

i.e., $7500 \times \frac{90}{100} = 6750$

S5. Ans (e)

Sol. required average $= \frac{6000 \times \frac{70}{100} + 8000 \times \frac{60}{100} + 6000 \times \frac{80}{100}}{3} = \frac{4200 + 4800 + 4800}{3}$

$= \frac{13800}{3} = 4600$

S6. Ans(b)

Sol.

Let total labor working in 2013 = 100x

Total child labor working in 2013 = 28x

ATQ –

$28x \times \left(\frac{4}{7} - \frac{3}{7}\right) = 48$

4x = 48

x = 12

Required difference = $1200 \times \left(\frac{40}{100} - \frac{32}{100}\right) = 96$

S7. Ans(e)

Sol.

Let total labors working in 2011 = 500y

So, total labors working in 2015 = 600y

Total female labor working in 2015 = $600y \times \frac{24}{100} = 144y$

Total child labors working in 2011 = $500y \times \frac{20}{100} = 100y$

Required percentage = $\frac{144y - 100y}{100y} \times 100$

$= 44\%$

S8.Ans(c)

Sol. Let total labors working in 2011 = x

And, total labors working in 2012 = y

Total male labors working in 2011 = 0.5x

And, total male labors working in 2012 = 0.48y

ATQ -

$\frac{0.5x}{0.48y} = \frac{5}{4}$

x : y = 6 : 5

so, y = $\frac{5x}{6}$

ATQ -

$x + \frac{5x}{6} = 2200$

x = 1200

y = 1000

Total child labors working in 2011 & 2012 together = $1200 \times \frac{20}{100} + 1000 \times \frac{20}{100} = 440$

S9.Ans(c)

Sol.

Total child labor working in 2014 = $\frac{2000}{25} = 80$

Total male labors working in 2014 = $80 \times \frac{60}{10} = 480$

Total child labor working in 2015 = 80 + 220 = 300

Total male labors working in 2015 = $300 \times \frac{56}{20} = 840$

Required ratio = $\frac{480}{840} = 4 : 7$

S10. Ans(e)

Sol.

Let total labors working in 2011, 2012 and 2013 be 80a, 100a & 50a respectively

Total female labors working in 2011 = $80a \times \frac{30}{100} = 24a$

Total female labors working in 2012 = $100a \times \frac{32}{100} = 32a$

Total female labors working in 2013 = $50a \times \frac{32}{100} = 16a$

ATQ –

24a + 32a + 16a = 720

72a = 720

a = 10

Total number of child labors working in 2011, 2012 and 2013

$= 800 \times \frac{20}{100} + 1000 \times \frac{20}{100} + 500 \times \frac{28}{100}$

= 160 + 200 + 140

= 500

S11. Ans(a)

Sol. Incentive given to HR department = $\frac{35}{100} \times 50000 = Rs\ 17500$

Incentive to each employee in HR = $\frac{17500}{60} = Rs\ 291.67$

S12. Ans(c)

Sol. required ratio = $\frac{\frac{15}{100} \times 50000}{80} : \frac{\frac{20}{100} \times 50000}{60} = 9 : 16$

S13. Ans(b)

Sol. required average = $\frac{10+20+20}{100} \times \frac{50000}{3} = 8333.33$

S14. Ans(e)

Sol. per employee incentive in Content department = $\frac{10}{100} \times \frac{50000}{150} = Rs\ 33.33$

Per employee incentive given in HR department = $\frac{35}{100} \times \frac{50000}{60} = Rs\ 291.67$

Required % = $\frac{291.67-33.33}{291.67} \times 100 = 88.57\% \approx 89\%$

S15. Ans(b)

Sol. per employee incentive

HR = $\frac{35}{100} \times \frac{50000}{60} = Rs\ 291.67$

Content = $\frac{10}{100} \times \frac{50000}{150} = Rs\ 33.33$

Blogging = $\frac{\frac{15}{100} \times 50000}{80} = Rs\ 93.75$

SEO = $\frac{20}{100} \times \frac{50000}{60} = Rs\ 166.67$

DTP = $\frac{20}{100} \times \frac{50000}{70} = Rs\ 142.86$

Per employee incentive given is maximum for HR department employees

Quiz – 29

S1. Ans(d)

Sol. required answer = $1000 \times \left(\frac{10}{100} \times \frac{3}{5} + \frac{15}{100} \times \frac{8}{15}\right) = 140$

S2. Ans(c)

Sol. required ratio = $\left(\frac{20}{100} \times 1000 \times \frac{1}{2}\right) + \left(\frac{25}{100} \times 1000 \times \frac{13}{25}\right) : \left(\frac{30}{100} \times 1000 \times \frac{13}{30}\right)$

= 23 : 13

S3. Ans(a)

Sol. duffel bags produced by company B = $\frac{10}{100} \times 1000 \times \frac{3}{5} = 60$

Backpacks produced by company D = $\frac{25}{100} \times 1000 \times \frac{13}{25} = 130$

Required % = $\frac{60}{130} \times 100 = 46\frac{2}{13}\%$

S4. Ans(e)

Sol. required average = $\frac{\frac{15}{100} \times 1000 \times \frac{7}{15} + \frac{25}{100} \times 1000 \times \frac{13}{25}}{2} = \frac{200}{2} = 100$

S5. Ans(b)

Sol. bags produced by company B & E together = $\frac{10+30}{100} \times 1000 = 400$

Duffel bags produced by company A, D & E together = $\frac{20}{100} \times 1000 \times \frac{1}{2} + \frac{25}{100} \times 1000 \times \frac{12}{25} + \frac{30}{100} \times 1000 \times \frac{13}{30} = 350$

Required % = $\frac{400}{350} \times 100 = 114\frac{2}{7}\%$

S6. Ans(c)
Sol.

Total number of males employees in company E = $5400 \times \frac{22}{100} \times \frac{2}{3} = 792$

Total number of female employees in company D = $5400 \times \frac{20}{100} \times \frac{3}{5} = 648$

Required ratio $= \frac{792}{648} = 11:9$

S7. Ans(a)

Sol. Total number of male employees in company A $= 5400 \times \frac{18}{100} \times \frac{2}{3} = 648$

Total number of female employees in company E = $5400 \times \frac{22}{100} \times \frac{1}{3} = 396$

Required percentage $= \frac{648}{396} \times 100 = 163.63\ \%$

$=164\%$ (approx.)

S8. Ans(b)

Sol. total male employees in company B,C and D together $= 5400 \times \frac{28}{100} \times \frac{3}{4} + 5400 \times \frac{12}{100} \times \frac{1}{3} + 5400 \times \frac{20}{100} \times \frac{2}{5} = 1134 + 216 + 432$

$=1782$

Required percentage $= \frac{1782}{5400} \times 100 = 33\%$

S9. Ans(d)
Sol.

Total female employees in all the 5 companies together

$= 5400 \times \frac{18}{100} \times \frac{1}{3} + 5400 \times \frac{28}{100} \times \frac{1}{4} + 5400 \times \frac{12}{100} \times \frac{2}{3} + 5400 \times \frac{20}{100} \times \frac{3}{5} + 5400 \times \frac{22}{100} \times \frac{1}{3}$

$=324 + 378 + 432 + 648 + 396$

$=2178$

S10. Ans(e)
Sol.

Central angle of total employees from company B and D together $= (28 + 20) \times \frac{360}{100}$

$=172.8°$

S (11-15):

Let the number of students in class IX be x

Number of boys in class VIII $= 0.5x$

Number of boys in class IX $= 0.4x$

Number of girls in class IX $= 0.6x$

Number of boys in class VI $= (0.6x+10) =$ Number of girls in class VIII

Number of girls in class VII $= (0.6x + 10) \times \frac{6}{5} = (0.72x + 12)$

Number of boys in class VII $= (0.6x + 10) \times 0.8 = (0.48x + 8)$

Number of girls in class VI $= (0.48x + 8) \times 1.75 = (0.84x + 14)$

ATQ

$x = 0.75 \times (0.72x + 12 + 0.48x + 8)$

$0.1x = 15$

$x = 150$

Class	Students	Girls	Boys
VI	240	140	100
VII	200	120	80
VIII	175	100	75
IX	150	90	60

S11. Ans(c)

Sol.

Required % $=\frac{50}{100} \times 100 = 50\%$

S12. Ans(b)

Sol.

Required difference $=(140 + 120 + 100 + 90) - (240 + 200) = 10$

S13. Ans(e)

Sol.

Required average $=\frac{240+200+175}{3} = 205$

S14. Ans(a)

Sol.

Total number of girls in all the given classes= 450

Total number of boys in all the given classes= 315

Required percent $=\frac{135}{450} \times 100 = 30\%$

S15. Ans(a)

Sol.

Required percent $=\frac{315}{765} \times 100 \approx 41\%$

Quiz – 30

S1. Ans(a)

Sol.

Let total income = 100x

ATQ –

$100x \times \left(\frac{25}{100} \times \frac{20}{100} + \frac{30}{100} \times \frac{40}{100}\right) = 40800$

$17x = 40800$

$x = 2400$

Income of C = $240000 \times \frac{30}{100} = 72000 \; Rs.$

S2. Ans(b)

Sol. Let total income in 2016 = 100n

Total income of B & D in the year 2016 = $100n \times \left(\frac{35}{100} + \frac{10}{100}\right) = 45n$

Total income of B & D in the year 2017 = $100n \times \left(\frac{35}{100} \times \frac{120}{100} + \frac{10}{100} \times \frac{140}{100}\right) = 56n$

Required ratio = $\frac{45n}{56n} = 45 : 56$

S3. Ans(d)

Sol. Let total income = 100b

And total expenditure of each A & B be 'E'

ATQ –

Required percent = $\frac{(35b - E) - (25b - E)}{10b} \times 100$

= $\frac{10b}{10b} \times 100 = 100\%$

S4. Ans(b)

Sol. Let total income = 100x

ATQ –

$25x - 10x = 30000$

$x = 2000$

Required difference = $200000 \left(\frac{35}{100} \times \frac{140}{100} - \frac{30}{100} \times \frac{120}{100}\right) = 26000 \, Rs.$

S5. Ans(c)

Sol. Let total income = 100x

Total income of A & D = 35x

Required angle = $\frac{35x}{100x} \times 360 = 126°$

S6. Ans(a)

Sol.

Books printed by publisher B in year 2015 and 2016 = $7500 \times \frac{60}{100} + 9000 \times \frac{55}{100}$

= 4500 + 4950 = 9450

Total books printed by publisher A in year 2013 = $6000 \times \frac{60}{100} = 3600$

Required percentage = $\frac{9450 - 3600}{3600} \times 100$

= 162.5%

S7. Ans(d)

Sol.

Books printed by publisher A in year 2013, 2015 and 2016

= $6000 \times \frac{60}{100} + 7500 \times \frac{40}{100} + 9000 \times \frac{45}{100}$

= 3600 + 3000 + 4050

= 10650

Required average = $\frac{10650}{3} = 3550$

S8. Ans(c)
Sol.

Total books printed by A in the year 2018 = $8000 \times \frac{1}{2} = 4000$

Books printed by B in the year 2018 = $4000 \times \frac{3}{5} = 2400$

Books printed by A in the year 2015 = $7500 \times \frac{40}{100} = 3000$

Required difference = $3000 - 2400 = 600$

S9. Ans(e)
Sol.

Cost of one book printed in 2016 by publisher A = $350 \times \frac{4}{5} = 280$ $Rs.$

Total cost price of all the books which is sold by publisher A in 2016 = $9000 \times \frac{45}{100} \times 280$

= 11,34,000 Rs.

S10. Ans(d)
Sol.

Total books printed by publisher A in 2014 and 2017 = $8000 \times \frac{25}{100} + 5000 \times \frac{35}{100}$

= 2000 + 1750 = 3750

Total books printed by publisher B in the year 2016 = $9000 \times \frac{55}{100} = 4950$

Required ratio = $\frac{3750}{4950} = 25 : 33$

S1. Ans.(d)
Sol. Number of male employees in company –A and C together = $45000 \times \frac{60}{100} + 60000 \times \frac{50}{100}$

= 27000 + 30000

= 57000

Required% = $\frac{57000 - 30000}{30000} \times 100 = 90\%$

S12. Ans.(b)
Sol. Female employees of company – A and B together = $45000 \times \frac{40}{100} + 30000 \times \frac{45}{100}$

= 18000 + 13500 = 31500

Male employees of company – B and D together = $30000 \times \frac{55}{100} + 50000 \times \frac{45}{100}$

= 16500 + 22500 = 39000

Required ratio = $\frac{31500}{39000} = \frac{21}{26} = 21 : 26$

S13. Ans.(d)
Sol. Male employees of company – E = $40000 \times \frac{65}{100} = 26000$

Total female employees in company A, B and C = $45000 \times \frac{40}{100} + 30000 \times \frac{45}{100} + 60000 \times \frac{50}{100}$

= 18000 + 13500 + 30000 = 61500

Required difference = $26000 - \frac{61500}{3} = 26000 - 20500 = 5500$

S14. Ans.(a)

Sol. Male employees of company – F = $45000 \times \frac{60}{100} \times \frac{130}{100} = 35100$

Female employees of company – F = $40000 \times \frac{35}{100} \times \frac{200}{100} = 28000$

Total employees of company – F = 28000 + 35100 = 63100

Required difference = 63100 – 50000 = 13100

S15. Ans.(c)

Sol. Male employees of company – B = $30000 \times \frac{55}{100} = 16500$

Total female employees of company – A and C = $45000 \times \frac{40}{100} + 60000 \times \frac{50}{100}$

= 18000 + 30000 = 48000

Required% = $\frac{48000 + 16500}{40000 + 50000} \times 100 = \frac{64500}{900}\% = 71\frac{2}{3}\%$

Quiz – 31

S1. Ans. (b)

Sol. $\frac{?}{100} \times 350 - 361 + 1260 = 1032$

$\frac{?}{100} \times 350 = 1032 - 899$

? = 38

S2. Ans. (a)

Sol. $(?)^2 = 39 + 420 + 217$

$(?)^2 = 676$

? = 26

S3. Ans. (d)

Sol. $\frac{46}{100} \times 1500 + \frac{36}{100} \times 750 = ? + 420$

? = 690 + 270 − 420

? = 540

S4. Ans. (d)

Sol. $? \times 13 = \frac{161}{6} \times \frac{156}{23}$

$? = \frac{182}{13}$

? = 14

S5. Ans. (c)

Sol. $\frac{?+26}{100} \times 1200 = 500 - 20$

$? + 26 = \frac{480}{12}$

? = 14

S6. Ans. (d)

Sol. $\frac{640}{?} = (3375 - 2700) \times \frac{1}{33.75}$

$\frac{640}{?} = 20$

? = 32

S7. Ans. (b)

Sol. $?^2 = \frac{85}{100} \times 280 + 34 - 224 + 96$

$?^2 = 144$

$? = 12$

S8. Ans. (b)

Sol. $39 + 441 - 90 = 5 \times ?$

$5 \times ? = 390$

$? = 78$

S9. Ans. (a)

Sol. $(?)^2 = \frac{48}{100} \times 800 + \frac{125}{100} \times 1200 - 120$

$(?)^2 = 384 + 1500 - 120$

$(?)^2 = 1764$

$? = 42$

S10. Ans. (b)

Sol. $\frac{?}{100} \times 700 = 1166 - 18$

$? = \frac{1148}{7}$

$? = 164$

S11. Ans(d)

Sol. $\frac{40}{100} \times 285 + \frac{60}{100} \times 175 \approx ? \times 73$

$114 + 105 \approx 73 \times ?$

$? \approx 3$

S12. Ans(e)

Sol. $379 - \frac{20}{100} \times 770 \approx (? + 6)^2$

$379 - 154 \approx (? + 6)^2$

$225 \approx (? + 6)^2$

$? \approx 9$

S13. Ans(b)

Sol. $(223 + 227) \div 9 \approx ? \times 10$

$50 \approx ? \times 10$

$? \approx 5$

S14. Ans(a)

Sol. $\sqrt{1444} - \sqrt{841} \approx \sqrt{?} - \sqrt{324}$

$38 - 29 \approx \sqrt{?} - 18$

$\sqrt{?} \approx 27$

$? \approx 729$

S15. Ans(e)
Sol. $10 \times 100 \times 1000 \approx 10000 \times$?
$? \approx 100$

Quiz – 32

S1. Ans(d)
Sol. Here the pattern is:
$9^3 - 1 = 728$
$8^3 + 1 = 513$
$7^3 - 1 = 342$
$6^3 + 1 = 217$
$5^3 - 1 = 124$
$? = 4^3 + 1 = $ **65**

S2. Ans(e)
Sol. Here the pattern is:
26 x 2 = 52
52 x 3 = 156
156 x 4 = 624
? = 624 x 5 = **3120**
3120 x 6 = 18720

S3. Ans(c)
Sol. Here the pattern is:
1+1 = 2
2+3 = 5
5+5 = 10
10+7 = 17
? = 17+9 = **26**

S4. Ans(a)
Sol. Here the pattern is:
137-13 = 124
124-15 = 109
109-17 = 92
92-19 = 73
? = 73-21 = **52**

S5. Ans(e)
Sol.
Pattern of series –
$16 \times 5 + 5 = 85$
$85 \times 4 + 4 = 344$
$? = 344 \times 3 + 3 = $ **1035**
$1035 \times 2 + 2 = 2072$
$2072 \times 1 + 1 = 2073$

S6. Ans(a)
Sol.
Wrong number = 104
Pattern of series –
12 + 27 = 39
39 + 24 = 63
63 + 27 = 90
90 + 24 = 114
114 + 27 = 141
141 + 24 = 165
So, 114 should come in the place of 104

S7. Ans(d)
Sol.
Wrong number = 562
$13 + 3^3 = 40$
$40 + 4^2 = 56$
$56 + 5^3 = 181$
$181 + 6^2 = 217$
$217 + 7^3 = 560$
$560 + 8^2 = 624$
So, 560 should come in the place of 562.

S8. Ans(c)
Sol.
Wrong number = 134
Pattern of series –
112 + 16 = 128
128 – 20 = 108
108 + 24 = 132
132 – 28 = 104
104 + 32 = 136
136 − 36 = 100
So, should be 136 come in the place of 134.

S9. Ans(d)
Sol.
Wrong number = 255
Pattern of series –
$120 = 11^2 - 1$
$145 = 12^2 + 1$
$168 = 13^2 - 1$
$197 = 14^2 + 1$
$224 = 15^2 - 1$
$16^2 + 1 = 257$
$288 = 17^2 - 1$
So, should be 257 come in the place of 255.

S10. Ans(d)
Sol.
Wrong number = 920
Pattern of series –
$5 \times 1 + 1 = 6$
$6 \times 2 + 2 = 14$
$14 \times 3 + 3 = 45$
$45 \times 4 + 4 = 184$
$184 \times 5 + 5 = 925$
$925 \times 6 + 6 = 5556$
So, 925 should come in the place of 920.

S11. Ans(b)
Sol. Here the pattern is:
111+96 = 207
207+95 = 302
302+94 = 396
396+93 = 489
? = 489+92 = **581**

S12. Ans(d)
Sol. Here the patten is:
$10^2 + 1 = 101$
$9^2 + 1 = 82$
$8^2 + 1 = 65$
$7^2 + 1 = 50$
$6^2 + 1 = 37$
$5^2 + 1 = $ **26**
Or –
101 – 19 = 82
82 – 17 = 65
65 – 15 = 50
50 – 13 = 37
? = 37 – 11 = 26

S13. Ans(e)
Sol. Here the pattern is:
40 x 1.5 = 60
60 x 2 = 120
120 x 2.5 = 300
300 x 3 = 900
? = 900 x 3.5 = **3150**

S14. Ans(a)
Sol. Here the pattern is:
1012-67 = 945
945-67 = 878
878 – 67 = 811
811 – 67 = 744
? = 744 – 67 = **677**

S15. Ans(b)
Sol. Here the pattern is:
13122÷ 3 = 4374
4374÷ 3 = 1458
1458 ÷ 3 = 486
486÷ 3 = 162
? = 162÷ 3 = **54**

Quiz – 33

S1. Ans(e)
Sol.
I. $x^2 + 4x + 5x + 20 = 0$
$x(x + 4) + 5(x + 4) = 0$
$(x + 4) (x + 5) = 0$
x = - 4, - 5
II. $y^2 + 5y + 7y + 35 = 0$
$y(y + 5) + 7(y + 5) = 0$
$(y + 5) (y + 7) = 0$
$y = -5 , -7$
So, x ≥ y

S2. Ans(c)
Sol.
I. x = + 8
II. y = ±8
So, x ≥ y

S3. Ans(b)
Sol.
I. $x^2 – 12x - 9x + 108 = 0$
$x(x -12) – 9(x - 12) = 0$
$(x -12) (x - 9) = 0$
x = 12, 9
II. $y^2 – 13y - 12y + 156 = 0$
$y(y - 13) - 12(y - 13) = 0$
$(y - 13) (y - 12) = 0$
y = 13, 12
So, x ≤ y

S4. Ans(e)
Sol.
I. $x^2 + 13x + 6x + 78 = 0$
$x(x + 13) + 6(x + 13) = 0$
$(x + 13)(x + 6) = 0$
$x = -13, -6$
II. $y^2 + 13y + 8y + 104 = 0$
$y(y + 13) + 8(y + 13) = 0$
$(y + 13)(y + 8) = 0$
$y = -13, -8$
No relation can be established between x and y.

S5. Ans(e)
Sol.
I. $x = \pm 15$
II. $y = 14$
So, no relation can be established between x and y.

S6. Ans(e)
Sol. I. $x^2 - 21x + 98 = 0$
$x^2 - 14x - 7x + 98 = 0$
$x(x-14) - 7(x-14) = 0$
$x = 7, 14$
II. $y^2 - 22y + 85 = 0$
$y^2 - 17y - 5y + 85 = 0$
$y(y-17) - 5(y-17) = 0$
$y = 5, 17$
So, no relation

S7. Ans(e)
Sol. I. $x^2 + 16x + 39 = 0$
$x^2 + 13x + 3x + 39 = 0$
$x(x+13) + 3(x+13) = 0$
$x = -3, -13$
II. $y^2 + 24y + 108 = 0$
$y^2 + 18y + 6y + 108 = 0$
$y(y+18) + 6(y+18) = 0$
$y = -6, -18$
So, no relation.

S8. Ans(c)
Sol. I. $x^2 + 5x - 14 = 0$
$x^2 + 7x - 2x - 14 = 0$
$x(x+7) - 2(x+7) = 0$
$x = 2, -7$

II. $y^2 - 15y + 56 = 0$

$y^2 - 8y - 7y + 56 = 0$

y(y-8) – 7(y-8) = 0

y = 7, 8

So, y>x

S9. Ans (e)

Sol. I. x² +20x - 96 =0

x² +24x-4x - 96 =0

x(x+24) -4(x+24) = 0

x = 4, -24

II. $y^2 + 7y - 78 = 0$

$y^2 + 13y - 6y - 78 = 0$

y(y+13) -6(y+13) = 0

y = 6, -13

So, no relation

S10. Ans(d)

Sol. I. x² +50x + 625=0

x² +25x+25x + 625=0

x(x+25) +25(x+25) = 0

x = -25

II. $y^2 + 45y + 500 = 0$

$y^2 + 20y + 25y + 500 = 0$

y(y+20) +25(y+20) = 0

y = -20, -25

So, x ≤y

S11. Ans(e)

Sol. I. x² + 10x + 21 = 0

x² + 7x+3x + 21 = 0

x(x+7)+3(x+7) = 0

x = -3,-7

II. y² + 11y + 28 = 0

y² + 4y+7y + 28 = 0

y(y+4)+7(y+4) = 0

y = -7, -4

So, no relation.

S12. Ans(e)

Sol. I. $2x^2 - 19x + 44 = 0$

$2x^2 - 11x - 8x + 44 = 0$

$x(2x-11) - 4(2x-11) = 0$

$x = 4, \frac{11}{2}$

II. $y^2 - 14y + 45 = 0$

$y^2 - 9y - 5y + 45 = 0$

$y(y-9) - 5(y-9) = 0$

$y = 5, 9$

So, no relation can be established

S13. Ans(a)

Sol. I. $x^2 - 22x + 85 = 0$

$x^2 - 17x - 5x + 85 = 0$

$x(x-17) - 5(x-17) = 0$

$x = 5, 17$

II. $5y^2 - 11y + 6 = 0$

$5y^2 - 5y - 6y + 6 = 0$

$5y(y-1) - 6(y-1) = 0$

$y = 1, \frac{6}{5}$

So, x>y

S14. Ans(b)

Sol. I. $x^2 = \sqrt{256}$

$x^2 = 16$

$x = +4, -4$

II. $(y+4)^2 = 0$

$y = -4$

So, x≥y

S15. Ans(d)

Sol. I. $x^2 + 18x + 72 = 0$

$x^2 + 12x + 6x + 72 = 0$

$x(x+12) + 6(x+12) = 0$

$x = -6, -12$

II. $y^2 + 12y + 36 = 0$

$y^2 + 6y + 6y + 36 = 0$

$y(y+6) + 6(y+6) = 0$

$y = -6$

So, x ≤y

S1. Ans. (e)

Sol. **I.** $x^2 + 6x + 5 = 0$

$x^2 + x + 5x + 5 = 0$

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

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

$x = -1, -5$

II. $y^2 + 6y + 8 = 0$

$y^2 + 4y + 2y + 8 = 0$

$y(y + 4) + 2(y + 4) = 0$

$(y + 2)(y + 4) = 0$

$y = -2, -4$

So, no relation.

S2. Ans. (d)

Sol. **I.** $x^2 - 9x + 14 = 0$

$x^2 - 7x - 2x + 14 = 0$

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

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

$x = 2, 7$

II. $y^2 - 16y + 63 = 0$

$y^2 - 9y - 7y + 63 = 0$

$y(y - 9) - 7(y - 9) = 0$

$(y - 7)(y - 9) = 0$

$y = 7, 9$

So, $x \leq y$.

S3. Ans. (c)

Sol. **I.** $2x^2 - 17x + 35 = 0$

$2x^2 - 7x - 10x + 35 = 0$

$x(2x - 7) - 5(2x - 7) = 0$

$(2x - 7)(x - 5) = 0$

$x = \frac{7}{2}, 5$

II. $(y + 7)^3 = 2197$

$(y + 7) = 13$

$y = 6$

So, $x < y$.

S4. Ans. (d)

Sol. **I.** $(x + 16)^2 = 529$

$x + 16 = \pm 23$

$x + 16 = 23 \qquad x + 16 = -23$

$\qquad x = 7 \qquad\qquad x = -39$

II. $y^3 = 343$

$y = 7$

So, $x \leq y$.

S5. Ans. (a)
Sol. **I.** $x^2 - 10x + 21 = 0$
$x^2 - 7x - 3x + 21 = 0$
$x(x - 7) - 3(x - 7) = 0$
$(x - 3)(x - 7) = 0$
$x = 3, 7$
II. $6y^2 - 23y + 20 = 0$
$6y^2 - 8y - 15y + 20 = 0$
$2y(3y - 4) - 5(3y - 4) = 0$
$(2y - 5)(3y - 4) = 0$
$y = \frac{5}{2}, \frac{4}{3}$
So, $x > y$.

S6. Ans. (a)
Sol. Missing number = 132
Pattern of series –
8 + 4 = 12
12 + 8 = 20
20 + 16 = 36
36 + 32 = 68
? = 68 + 64 = **132**

S7. Ans. (d)
Sol. Missing number = 2
Pattern of series –
$0.25 \times 2 = 0.5$
? = $0.5 \times 4 = $ **2**
$2 \times 6 = 12$
$12 \times 8 = 96$
$96 \times 10 = 960$

S8. Ans. (b)
Sol. Missing number = 124
Pattern of series –
124 $+ (40 \times 1) = 164$
$164 + (40 \times 3) = 284$
$284 + (40 \times 5) = 484$
$484 + (40 \times 7) = 764$
$764 + (40 \times 9) = 1124$

S9. Ans. (c)
Sol. Missing number = 734
Pattern of series –
$1600 - 8^3 = 1088$
$1088 - 7^2 = 1039$
$1039 - 6^3 = 823$
$823 - 5^2 = 798$
$798 - 4^3 = $ **734**

S10. Ans. (a)

Sol. Missing number = 124

Pattern of series –

$12^2 + 3 = 147$

$11^2 + 3 = \mathbf{124}$

$10^2 + 3 = 103$

$9^2 + 3 = 84$

$8^2 + 3 = 67$

$7^2 + 3 = 52$

Or

$147 - 23 = \mathbf{124}$

$124 - 21 = 103$

$103 - 19 = 84$

$84 - 17 = 67$

$67 - 15 = 52$

S11. Ans. (e)

Sol. $324 + 484 = ? + 512$

$? = 808 - 512$

$? = 296$

S12. Ans. (e)

Sol. $\frac{?}{100} \times 800 = \frac{30}{100} \times 100 + \frac{20}{100} \times 650$

$? \times 8 = 30 + 130$

$? = \frac{160}{8}$

$? = 20$

S13. Ans. (b)

Sol. $? = 1072 - 628$

$? = 444$

S14. Ans. (a)

Sol. $? - 256 = 130$

$? = 386$

S15. Ans. (b)

Sol. $? = \frac{37}{8} + \frac{3}{2} - \frac{8}{3}$

$? = \frac{111 + 36 - 64}{24}$

$? = \frac{83}{24}$

$? = 3\frac{11}{24}$

S1. Ans.(d)

Sol. $\frac{40}{100}y - \frac{20}{100}x = 270$

$\Rightarrow 2y - x = 1350$ …(i)

and $\frac{40}{100}x - \frac{20}{100}y = 0$

$2x - y = 0$ …(ii)

On solving (i) & (ii)

x = 450

y = 900

Required sum = 1350

S2. Ans.(b)

Sol. Let 200 promised to P & 300 to Q

After they went back from promise

P got

$= 200 - 200 \times \frac{25}{100} + 300 \times \frac{30}{100}$

= 240 votes

Q got = $300 - 300 \times \frac{30}{100} + 50$

= 260 votes

Q wins by 20 unit which is equal to 400 votes

$\therefore 1\ unit = \frac{400}{20} = 20$

And total votes = 20 × 500

= 10000 votes

S3. Ans.(c)

Sol.

Let present age of Veer = 7x

And present age of Rohit = 5x

Present age of Arun = 5x + 10

ATQ,

$\frac{7x-10}{5x} = \frac{16}{15}$

$\Rightarrow 105x - 150 = 80x$

x = 6

Hence present age of Rohit = 5 × 6 = 30 years

S4. Ans.(e)

Sol.

Let age of Abhi and Rahul seven years ago be 5x and 3x respectively.

ATQ,

$\frac{5x+15}{3x+15} = \frac{3}{2}$

x = 15

Present age of Sati

$= \frac{15 \times 8 + 14}{2} = 67$ years.

S5. Ans.(b)
Sol. Let present age of Mohan = x
So, ATQ
$\frac{5}{6} \times x = x - 5$
x = 30
His wife's age = 30 – 3 = 27

S6. Ans.(c)
Sol.
Let Rahul's age — x years.
Then, Aman's age — 2x years
Arun's age — x – 5
ATQ,
2x + x + x – 5 = 79
x = 2 years
Required difference = 2x – (x – 5) = 26 years

S7. Ans.(e)
Sol. ∵ a, b, c and d are four consecutive numbers and a + c = 120
∴ a +a+4 = 120
⇒ 2a = 116 ⇒ a = 58
∴ b = 60 and d= 64
∴ b × d = 60 × 64 = 3840

S8. Ans.(d)
Sol. Let the numbers be a, b, and c respectively.
∴ $\frac{a+c}{2} - \frac{b+c}{2} = 24$
⇒ (a +c) – (b + c) = 24 × 2 = 48
⇒ a –b = 48

S9 Ans.(e)
Sol.
Let two-digit number = 10x + y
According to question
x + y = 12 ..(i)
and $|x - y| = 6 \Rightarrow x - y = \pm 6$ ..(ii)
By solving equation (i) and (ii)
x = 9 or x = 3
y = 3 or y = 9
∴ Required two-digit number
= 10x + y = 10 × 9 + 3 Or 10x + y = 10 × 3 + 9
= 90 + 3 = 93 or 30+9 = 39
93 & 39 both can be the answers
So, Either (a) or (c)

S10. Ans.(d)

Sol. Sum of present age of couple = 2 × 29 = 58

Age of family after 8 years

= 58 + 8 × 2 + (8 − 2) + (8 − 4)

= 58 + 16 + 6 + 4

= 84

Required average = $\frac{84}{4}$ = 21

S11. Ans.(d)

Sol. Second no. = $\frac{100 \times 12}{100}$ = 12

∴ first no. = $12^3 \times \frac{3}{2}$ = 1728 $\times \frac{3}{2}$

= 2592

∵ Required sum = 12 + 2592 = 2604

S12. Ans.(e)

Sol. Let present age of Bhagat & Abhi be 9x and 8x respectively

After 10 years.

$\frac{9x+10}{8x+10} = \frac{10}{9}$

81x + 90 = 80x + 100

x = 10

∴ required difference = 10 years.

S13. Ans.(d)

Sol.

$$\begin{matrix} 25 & : & 16 & + & 9 \\ 2100 \Big(& & \big(+25\% = \frac{1}{4}\big) & & \big)+\frac{1}{3} \\ \downarrow & & \downarrow & & \downarrow \\ 32 & = & 20 & & 12 \end{matrix}$$

7 unit → 2100

I = E + S

∴ 9 unit → 300 × 9 = Rs. 2700.

S14. Ans.(e)

Sol. Let the four consecutive even no. be (x − 3), (x − 1), (x + 1) & (x + 3)

And three consecutive odd no. be (y − 2) , y, (y + 2)

ATQ,

4x − 3y = 49 …(i)

x − 3 + y − 2 = 23

x + y = 23 + 5

x + y = 28 …(ii)

Multiplying (ii) by 3 and on solving
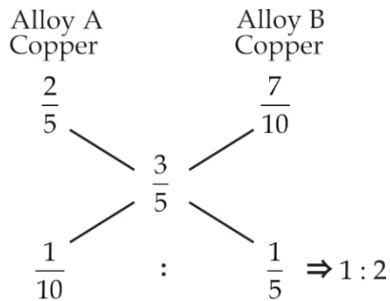
∴ x = 19

y = 9

∴ largest even no. = 19 + 3 = 22

S15. Ans.(c)
Sol. Required number of students
$= 1800 \times \frac{22}{25} \times \frac{4}{9}$
$= 704$

Quiz – 36

S1. Ans.(a)
Sol.

Alloy A   Alloy B
Copper   Copper

$\frac{2}{5}$ $\frac{7}{10}$

$\frac{3}{5}$

$\frac{1}{10}$: $\frac{1}{5}$ $\Rightarrow 1:2$

S2. Ans.(b)
Sol. Let total quantity of mixture initially $= 100x$
So quantity of milk initially $= 75x$
So quantity of water initially $= 25x$
8 liter of mixture is taken out
So, $\frac{8 \times 75}{100} = 6$ liter of milk is taken out
$8 - 6 = 2$ liter of water is taken out
Now,
ATQ,
$\frac{75x - 6 + 7}{25x - 2} = \frac{7}{2}$
$x = \frac{16}{25}$
So initial quantity of mixture $= \frac{16}{25} \times 100 = 64$ L

S3. Ans.(a)
Sol. Let larger part is = Rs y.
Then smaller part = Rs. (1800 – y)
ATQ,
$\frac{y \times x \times 2}{100} + (1800 - y) \times \frac{4 \times 2}{100} = 164$
2xy + 14400 – 8y = 16400 … (i)
and
$\frac{y \times 4 \times 2}{100} + (1800 - y) \times \frac{x \times 2}{100} = 160$
8y + 3600x – 2xy = 16000 … (ii)
Adding (i) and (ii)
3600x = 16400 +16000 – 14400
x = 5
x% = 5%

S4. Ans(d)

Sol. sum left at the end of first year = $\left(400 + 400 \times \frac{10}{100}\right) - 200 = Rs.\,240$

sum left at the end of 2nd year = $\left(240 + 240 \times \frac{10}{100}\right) - 64 = Rs.\,200$

sum paid at the end of 3rd year to clear his debt. = $\left(200 + 200 \times \frac{10}{100}\right) = Rs.\,220$

S5. Ans(c)

Sol. quantity of water and acid in initial mixture = $50 \times \frac{40}{100}, 50 \times \frac{60}{100} = 20\,lit\ and\ 30\ lit\ respctively.$

Quantity of acid left after 30 lit of mixture taken out = $30 - 30 \times \frac{3}{5} = 12\ lit.$

Quantity of water left after 30 lit of mixture taken out = $20 - 30 \times \frac{2}{5} = 8\ lit.$

Required ratio = $\left(8 + 50 \times \frac{60}{100}\right) : \left(12 + 50 \times \frac{40}{100}\right) = 19:16$

S6. Ans(b)

Sol. let total time of investment = 60t months

Ratio of profit of A, B and C

$5 \times 60t \times \frac{1}{12} : 3 \times 60t \times \frac{1}{5} : 7 \times 60t \times \frac{1}{15}$

$\Rightarrow 25:36:28$

ATQ

$(36 - 28)units = Rs.\,800$

Then, 25 units = Rs. 2500

S7. Ans.(a)

Sol. Rate of interest (x) = $\frac{910 - 845}{845} \times 100 = \frac{65}{845} \times 100 = 7\frac{9}{13}\%$

Total CI = 910 + 845 = Rs. 1755

Let 'p' amount was invested

C.I. = $P\left[\left(1 + \frac{R}{100}\right)^T - 1\right]$

$1755 = P\left[\left(1 + \frac{1}{13}\right)^2 - 1\right]$

$1755 = P \times \frac{27}{169}$

$P = \frac{1755 \times 169}{27} = Rs.\,10985$

S8. Ans (b)

Sol. Let the sum and rate of interest be Rs P and R% respectively.

Second year C.I. = 2 years S.I. + interest of one year on first year S.I.

2-year S.I. = Rs.500

1-year S.I. = Rs.250

So, interest on first year S.I. = 550 – 500 =Rs. 50

Rate of interest = $\frac{50}{250} \times\times 100 = 20\%$

S9. Ans (e)

Sol. Let quantity of two type of rice be 5x and 3x respectively.

Total cost = $5x \times 90 + 3x \times 40 = Rs\ 570x$

So, per kg price of sugar= $\frac{570x}{5x+3x} = \frac{570x}{8x} = Rs\ 71.25\ per\ kg$

S10. Ans.(a)

Sol. Atq

$66\frac{2}{3}\% \rightarrow \frac{2}{3}$

$\frac{(x-30)\frac{13}{20}+2.5}{(x-30)\frac{7}{20}} = \frac{2}{1}$

$\Rightarrow \frac{13}{20}x - 19.5 + 2.5 = \frac{14}{20}x - 21$

$\frac{x}{20} = 21 - 17$

x = 20 × 4

x = 80 lit

S11. Ans (e)

Sol. Let Sunny invested for T months.

Ratio of profit share of Dinesh and Sunny $= \frac{12000 \times 12}{9000 \times T} = \frac{16}{T}$

Let profit share of Dinesh and Sunny be Rs 16x and Rs Tx respectively.

ATQ

$16x + Tx = 8000$

And $Tx = 1600$

So, $16x = 6400$

$x = 400$

$T = 4$

Sunny invested for 4 months.

∴ after 8 months sunny joined the business.

S12. Ans (a)

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

Simple interest for first year and second year is Rs 140 and Rs 140 respectively.

For first year compound interest and simple interest are same.

So, Compound interest for second year $= 308 - 140 = Rs\ 168$

Rate of interest $= \frac{168-140}{140} \times 100 = 20\%$

So, sum $= \frac{280 \times 100}{20 \times 2} = Rs\ 700$

S13. Ans (d)

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

ATQ

$868 - P = \frac{P \times R \times 4}{100}$ ……..(i)

Now,

$910 - P = \frac{P \times \frac{125}{100} \times R \times 4}{100}$ …….(ii)

By dividing (i) from (ii)

$\frac{868-P}{910-P} = \frac{P \times R \times 4}{P \times \frac{125}{100} \times R \times 4}$

$\frac{868-P}{910-P} = \frac{4}{5}$

$4340 - 5P = 3640 - 4P$

$P = Rs\ 700$

S14. Ans (e)

Sol. Fraction of petrol taken out from the initial quantity

$= \frac{20}{240} = \frac{1}{12}$

So, remaining quantity of petrol in the final mixture

$= 240 \times \frac{11}{12} \times \frac{11}{12} = 201.66 \; lit$

S15. Ans.(a)

Sol. Profit sharing ratio of A, B & C

= (2000 × 12) : (2500 × 12) : (1500 × 4)

= 24000 : 30000 : 6000

= 4 : 5 : 1

Let total profit be Rs. P

ATQ,

$\frac{1}{(4 + 5 + 1)} \times P = 350$

P = Rs. 3500