351. ?% of 24 = 3 $\Rightarrow$? = $\frac{31\times100}{24}$ = **12.5**

352. Let the required number be "N". Thus, we get, $\frac{3}{7}$ of $\frac{2}{5}$ N = 198 $\Rightarrow$ N = **1155**

353. 10 $\xrightarrow{\times2+1}$ 21 $\xrightarrow{\times3+1}$ 64 $\xrightarrow{\times4+1}$ 255 $\xrightarrow{\times5+1}$ 1286 $\xrightarrow{\times6+1}$ 7717 $\xrightarrow{\times7+1}$ 54020

Thus 64 ×4 + 1 = **257** (and not 255)

354. Let the cost price for "A" be Rs. "X".

Thus, we get 1.2 × (1.1X) = Rs.2310

$\Rightarrow$ **X=Rs.1750**

355. The marked price for two articles together = (37.40 ÷ 0.85) = Rs. 44. Hence, the marked price for one article = Rs.**22.**

356. Required fraction = 3 ÷ 60 = **1 ÷ 20**

357. Let the required ratio be "X : Y", Thus, we get, $\frac{(X-Y)}{(X+Y)}\times4401 = 489 \Rightarrow \frac{(X-Y)}{(X+Y)} = \frac{1}{9}$

$\therefore \frac{(X-Y)+(X+Y)}{(X-Y)-(X+Y)} = \frac{1+9}{1-9} = \frac{2X}{-2Y} \Rightarrow \frac{X}{Y} = \frac{5}{4}$

359. $? = 6\frac{1}{4} \div 1\frac{2}{3} - 1\frac{1}{3}$

$= \frac{25}{4} \div \frac{5}{3} - \frac{4}{3} = \frac{25}{4} \times \frac{3}{5} - \frac{4}{3}$

$= \frac{15}{4} - \frac{4}{3} = \frac{45-16}{12}$

$= \frac{29}{12} = 2\frac{5}{12}$

365. 40% of 2400 + ? % of 600 = 50% of 3840

or, $\frac{40\times2400}{100} + \frac{?\times600}{100} = \frac{50\times3840}{100}$

or, 960 + ? × 6 = 1920

or, ? × 6 = 1920 – 960 = 960

$\therefore ? = \frac{960}{6}$ = **160**

366. 175 × ? + 140% of 1200

or 175 × ? = 140 × 12

$\therefore ? = \frac{140\times12}{175}$ = **9.6**

373. 10 articles for Rs. 8 i.e. 80 paise per article sold for Rs. 1.25 per article

Bought for = 80 paise

gain / article = (1.25 – 0.80)= 45 paise

gain percent = $\frac{45}{80}\times100 = 56\frac{1}{4}$**%**

374. 48% is $\frac{216}{25}$ 100% is ?

$\frac{100}{48}\times\frac{216}{25}$ = **18**

375. A : B : C = $1\frac{1}{2} : 3\frac{1}{3} : 2\frac{3}{4}$ or $\frac{3}{2} : \frac{10}{3} : \frac{11}{4}$

$\frac{18:40:33}{12}$

A : B : C = 18 : 40 : 33 (sum of the ratio 18 + 40 + 33 = 91)

B's share = 91 × $\frac{40}{91}$ = **Rs. 40**

378. Simple Interest = $\frac{P\times r\times t}{100}$

Here, P = 600

r = 18%, t = 9 months = 0.75 year

Simple interest = $\frac{600\times18\times0.75}{100}$ = **Rs. 81**

379. A : B = 5 : 4 or 10 : 8 .... (1)

B : C = 8 : 35 .... (2)

From equations (1) and (2)

A : C = 10 : 35 = **2 : 7**

380. $\sqrt{0.0081} = \sqrt{0.09\times.009}$ = **0.09**

381. 8008–8000÷10.00 = x.

x = 8008 – 800 = **7208**

382. Average of 9 numbers = 7

Then sum of numbers = 9 × 7 = 63

Average of 7 numbers = 9

Then Sum of numbers = 9 × 7 = 63

Total Sum of 16 numbers = 63 + 63 = 126

Average of 16 numbers = $\frac{126}{16}, 7\frac{14}{16}$

383. Choice a) gives 6^2 = 36. Choice b) gives 4^4 = 256. Choice c) is 8^2 = 64.

Choice d) is 2 + 4 + 4 = 10. Choice e) is 4^3 = 64. Hence (b) is correct.

384. The cost of producing the first 8,000 copies is 1,000 + 7,000 x. Therefore

$1{,}000 + 7{,}000x = 7{,}230$ i.e., $7{,}000x = 6{,}230$ and therefore $x = \mathbf{0.89}$.

385. $1\frac{1}{4}(x) = \frac{1}{2}; \frac{5}{4}x = \frac{1}{2}; \quad \mathbf{x = \frac{2}{5}}$

386. Let the number of workers in the institution be x

The number of workers other than officers = (x – 12)

The total salary of the 12 officers = Rs.400×12

∴ The total salary of the rest = Rs. 56×(x – 12)

The total salary of all the workers = 60x

From the problem,

$60x = (400 \times 12) + 56 \times (x - 12)$;

i.e. $60x - 56x = 400 \times 12 - 56 \times 12$

$4x = 12\,(400 - 56)$; $4x = (12)\,(344)$;

$x = \frac{(12 \times 344)}{4}$.

∴ Total number of workers = **1032**

387. In a km race (i.e. 1,000 m) when A runs 1,000 m, B runs 980 m. Therefore, when A runs 100 m B can run only 98 m. In 500 m race, when B runs 500 m, C runs 485 m.

When B runs 98 m, C can run $485 \times \frac{98}{500}$ m, i.e. 95.06 m

i.e. when A runs 100 m. B runs 98 m and C runs 95.06 m

∴ A beats C by (100 – 95.06). i.e. **4.94 m in** a 100 m race.

388. 152 pounds and 4 ounces = 152.25 pounds; 152.25 ÷ 3 = 50.75 pounds

0.75 or 3/4 pounds = **12 ounces.**

389. 4 men = 7 boys. i.e. 1 man = $\frac{7}{4}$ boys

∴ 12 men = $\frac{7}{4} \times 12$ boys. i.e. 21 boys

∴ 12 men + 8 boys = (21 + 8) boys.

i.e. 29 boys

Let x represent the answer required.

No. of boys	No. of days
7	29
29	x

$\frac{7}{29} \times 29 = 7$. ∴ 12 men and 8 boys will take **7 days** to do the work.

390. $\left(a + \frac{1}{a}\right)^2 = a^2 + \frac{1}{a^2} + 2.a.\frac{1}{a} = a^2 + \frac{1}{a^2} + 2$

$(5)^2 = a^2 + \frac{1}{a^2} + 2$; $25 - 2 = a^2 + \frac{1}{a^2}$;

$23 = a^2 + \frac{1}{a^2}$

391. $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca) = 0$

$(\because a + b + c = 0)$. ∴ $a^3 + b^3 + c^3 = \mathbf{3\,abc}$

392. $\frac{40}{1000} = \mathbf{0.04}$

393. By data : 75% of (x + 75) = x.

i.e. $\frac{3}{4}x + 75 = x \Rightarrow 3x + 300 = 4x$

$\Rightarrow \mathbf{x = 300}$

394. A : B : C

4 : 5

3 : 8

12 : 15 : 40

∴ A : C = **12 : 40**

395. $\frac{A}{2} = \frac{B}{3} = \frac{C}{4} = x\,(\text{say}) \Rightarrow A = 2x;\ B = 3x;\ C = 4x$

$\therefore 2x + 3x + 4x = 8100 \Rightarrow x = 900$

$\Rightarrow A = 2(900) = \mathbf{1800}$

396. Lowest C.P. is Rs. 200

Lowest S.P. is Rs. 300 ⇒ profit = Rs. 100

Highest C.P. is Rs. 350

Highest S.P. is Rs. 425 ⇒ profit = Rs. 75

∴ Maximum profit = Rs. 100

Hence, maximum profit on 16 such articles = Rs. (16 × 100) = **Rs. 1600.**

397. By data : $A = P\left(1 + \frac{nr}{100}\right)$

$2{,}442 = P\left(1 + \frac{4 \times 12}{100}\right)$

$\Rightarrow \quad P = \frac{2{,}442 \times 100}{148} = \mathbf{Rs.1{,}650}$

398. Let the speed of boat in still water be x km/hr; Speed of stream be y km/hr

Speed of boat in upstream = (x – y) km/hr;

Speed of boat in downstream = (x + y) km/hr

By hypothesis $\frac{9}{x-y} = 3 \Rightarrow x - y = 3$ .....(1)

$\frac{18}{x+y} = 3 \Rightarrow x + y = 6$ .....(2)

Adding (1) & (2)

we get $2x = 9 \Rightarrow$ **x = 4.5 km/hr**

399. Common difference between the consecutive terms of the series is 3.

2nd term = 1st term + 3 = 1 + 3 = 4

3rd term = 2nd term + 3 = 4 + 3 = 7

4th term = 3rd term + 3 = 7 + 3 = 10

Hence, 5th term = 4th term + 3 = 10 + 3 = **13**

400. The required no. $= \frac{7700 \times 1}{275} =$ **308**

401. $? = \frac{0.46 - 0.046}{0.046 \div 4.6} = \frac{0.414}{0.01} =$ **41.4**

402. $? = \frac{(7.59)^2 - (5.23)^2}{3 - 0.64} = \frac{(7.59 + 5.23)(7.59 - 5.23)}{2.36}$

$= \frac{12.82 \times 2.36}{2.36} =$ **12.82**

403. $? = \sqrt{\frac{0.361}{0.00169}}; \sqrt{\frac{361}{1.69}} = \sqrt{\frac{36100}{169}} = \frac{190}{13}$

404. According to question, $\frac{1}{10}x = \frac{1}{5}y$

$\therefore \frac{x}{y} = \frac{10}{5} = \frac{2}{1}$

$\therefore x : y =$ **2 : 1**

405. The sum $= \frac{n(n+1)}{2} = \frac{50(50+1)}{2}$

$= \frac{50 \times 51}{2} = \frac{2550}{2} = 1275$

$\therefore$ Required average $= \frac{1275}{50} =$ **25.50**

406. The required percentage $= \frac{40}{1200} \times 100$

$= \frac{10}{3} = 3\frac{1}{3}$

407. Let the first and second numbers be x and y respectively.

$\therefore \frac{x}{y} = \frac{3}{7}$; or, $7x - 3y = 0$ .....(1)

and $\frac{x-12}{y-12} = \frac{9}{37}$; or, $37x - 444 = 9y - 108$

or, $37x - 9y = 336$ .....(2)

By equating above eqn. (1) and (2), we have, **x = 21** and **y = 49.**

408. 2 $\xrightarrow{x1+1^2}$ 3 $\xrightarrow{x2+2^2}$ 10 $\xrightarrow{x3+3^2}$ 39 $\xrightarrow{x4+4^2}$ 172 $\xrightarrow{x5+5^2}$ 885 $\xrightarrow{x6+6}$?

Thus,? $= 885 \times 6 + 6^2 = 5310 + 36 =$ **5346**

409. Let the earlier salary per annum be Rs. "X"

Thus, we have (X) + 5% of (X) = 15120 $\Rightarrow$ X = Rs.14400. Thus, required monthly salary = 14400 ÷ 12 = **Rs.1200.**

410. $\frac{A}{D} = \frac{A}{B} \times \frac{B}{C} \times \frac{C}{D} = \frac{3}{4} \times \frac{5}{9} \times \frac{3}{5} = \frac{1}{4}$

$\Rightarrow$ **A : D : : 1 : 4**

411. Let the required two digit number be "XY". Thus, we get **(i)** (X + Y) = 12 and **(ii)** (10Y + X) = (4 – 7) of (10X + Y)

$\therefore$ 70Y + 7X = 40X + 4Y

$\Rightarrow$ 66Y = 33X $\Rightarrow$ X = 2Y

$\therefore$ 3Y = 12 $\Rightarrow$ Y = 4 $\therefore$ x=8.

Thus, the required two-digit number is **84.**

412. Let the original cost price of the article be Rs. "X". Thus, we get X + 22% of X = 61 $\Rightarrow$ **X = Rs.50**

413. Let C's contribution be Rs. "X". Thus B's contribution would be "X+3000" and A's contribution would be "X + 9000". Thus, we get, [(X + 9000)+(X+3000)+(X)] = 75000 $\Rightarrow$ X = 21000. Hence, the profit sharing ratio of A,B and C would be given as equal to "30 : 24 : 21" or "10 : 8 : 7". Hence, out of the total overall profit of Rs.25, A's share would be Rs.10. Hence, out of the total profit of Rs.25000, **A's share would be Rs. 10000.**

414. Required number of men $= \frac{39 \times 14}{6} =$ **91**

415. Observe that (2 ÷ 3) = (6 ÷9). Thus, when the difference in the numerator and denominator figures is constant, the ascending order would be (5 ÷ 8) followed by (6 ÷ 9) followed by (11 ÷ 14). Thus, the descending order of values would be the reverse sequence.

416. See the figures draw below:-

ⓡ = 17.5 cm

Required perimeter = $\pi r + 2r$

$= \left(\frac{22}{7} \times 17.5\right) + 35 =$ **90 cms**

417. Let the cost price of the article be Rs.100. Thus, the sales price must be (100 + 20% of 100) = Rs. 120.

Hence, the marked price = (120 ÷ 0.8) = Rs. 150. Thus, the required hike would be equal to = [(150 – 100) ÷ 100] × 100% = **50%**

418. $1\frac{7}{9} \times \frac{9}{20} + 2\frac{5}{8} \times 1\frac{1}{15}$

$= \left(\frac{16}{9} \times \frac{9}{20}\right) + \left(\frac{21}{8} \times \frac{16}{15}\right)$

$= \frac{4}{5} + 7 \times \frac{2}{5} = \frac{18}{5}$

419. $3\frac{12}{17} \div 1\frac{11}{34} = \frac{63}{17} \div \frac{45}{34} = \frac{63}{17} \times \frac{34}{45} = 2\frac{4}{5}$

420. $20 \div \left(2 + \overline{5-3}\right) = 20 \div (2+2) = 20 \times \frac{1}{4} = 5$

421. Distance = 72 km; Speed = 60km/hour

Time = $\frac{\text{Distance}}{\text{Speed}} = \frac{72}{60} =$ **1.2 or 1 hour 2 min**

422. D = S × T

Speed = 15 m/s Time = 4 Hours

Distance = 15 (4 × 60 × 60) = 216000 m

=216 km.

424. $\frac{6}{18} \div ? = 18 = \frac{6}{18} \times \frac{1}{?} = 18 = \frac{6}{18 \times 18} = \frac{1}{54}$

426. Rotten apples = 25%

Number of Rotten apples = 700

Total number of apples = $\frac{700 \times 100}{25} =$ **2800**

427. $\left(999^2 - 998^2\right) \div 20 \times 100 + 40 = ?$

$= [(999 + 998) - (999 - 998)] \div 20 \times 100 + 40$

$= \frac{1997}{20} \times 100 + 40 =$ **10025**

428. L.C.M of 3, 6 and 15 = 30.

30 is not between 50 and 100.

$\therefore$ 30 × 2 = **60.**

429. 32% – 20% = 42 + 30

12% = 72

$\therefore 100\% = \frac{12}{100} \times x = 72$

$x = \frac{7200}{12} = 600$

100% = **600**

430. $v = \frac{1}{3}\pi r^2 h = \frac{1}{3} \pi \times 6^2 \times 12 =$ **144π**

431. CP of 12 pens = Rs. 12 (Assumed)

$\therefore$ SP of 10 pens = Rs.12

SP of 12 pens = $\frac{12}{10} \times 12 =$ Rs.14.40

Gain = Rs. 2.40

Gain % = $\frac{2.40}{12} \times 100 =$ **20%**

433. Marked price = Rs.300 Discount = 25%

SP = $\frac{75}{100} \times 300 =$ Rs.225 Gain = 12.5%

CP = $\frac{100}{112.5} \times 225 =$ **Rs.200**

434. A : B : C = 7 : 8 : 11 LCM = 26

B's Hire charges = 520 × $\frac{8}{26} =$ **Rs.160**

435. Required difference = $\frac{4}{5} \times 700 - \frac{5}{7} \times 550$

$= 560 - 393 =$ **167**

436. Let the two numbers be 5x and 4x.

40% of the first number = $\frac{40}{100} \times 5x = 12$

2x = 12

x = 6

50% of the second number = $\frac{50}{100} \times 4 \times 6 =$ **12**

437. $\frac{2}{5} \times \frac{1}{4} \times \frac{3}{7} \times x = 15$

$x = \frac{15 \times 5 \times 4 \times 7}{2 \times 3} = 350$

Required number = $\frac{1}{2} \times 350 =$ **175**

438. $1.542 \times 2408.69 + 1134.632 = ?$

$= 3714.1999 + 1134.632$

$= \mathbf{4848.19}$

439. 143% of $3015 + 1974 = 9500 - ?$

$= \frac{143}{100} \times 3015 + 1974 = 9500 - ?$

$= 4311.45 + 1974 = 9500 - ?$

$= 9500 - 4311.45 - 1974 = \mathbf{3214.55}$

441. $16\sqrt{49} + 1492 - 250.52 = ?$

$16 \times 7 + 1492 - 250.52 = ?$

$1604 - 250.52 = \mathbf{1353.48}$

442. $152\sqrt{?} + 795 = 8226 - 3400$

$152\sqrt{?} = 4826 - 795$

$152\sqrt{?} = 4031$

$\sqrt{?} = \frac{4031}{152}$

$\sqrt{?} = 26.52$

$? = \mathbf{703.31}$ (approximate value)

443. $x + \frac{1}{5} \times \frac{1}{3} \times \frac{1}{2} = 15 \Rightarrow \mathbf{450}$

444. $x + y = 2(x - y) \Rightarrow x = 3y \Rightarrow x = 3 \times 10 = 30$

445. $10\frac{5}{6} \div 91 \Rightarrow \frac{65}{6} \div 91 \Rightarrow \frac{5}{42}$

446. $\frac{1}{2 + \frac{1}{3 + \frac{1}{1 + \frac{1}{4}}}} = \frac{1}{2 + \frac{1}{3 + \frac{4}{5}}}$

$= \frac{1}{2 + \frac{1}{\frac{19}{5}}} = \frac{1}{2 + \frac{5}{19}} = \frac{19}{43}$

447. $\frac{\sqrt{(\sqrt{5} + 1)^2}}{5 - 1} = \frac{\sqrt{5} + 1}{2} = \mathbf{1.61}$

448. $(x + y)^{x/y} = (16)^3 = \mathbf{4096}$

449. $1 : 2 : 3 \Rightarrow x^2 + 2x^2 + 3x^2 = 504$

$14x^2 = 504;\ x^2 = 36;\ x = 6$

Ratio - $1 : 2 : 3$

The numbers are **6 : 12 : 18**

450. $15 : 5 = 192 : x \Rightarrow x = \frac{192 \times 5}{15} = \mathbf{64}$

451. Salary = Rs. 50,128 (Annual)

$12\frac{1}{2}\% = \frac{1}{8}$

$\frac{1}{8} \times 50128 = \text{Rs. } \mathbf{6,266}$

452. Total age of 30 boys $= 14 \times 30 = 420$

When teacher's age is included $= 15 \times 31 = 465$

$\therefore 465 - 420 = \mathbf{45}$

453. $1200 \times \left(1 + \frac{R}{100}\right)^2 = 1348.32$

$\left(1 + \frac{R}{100}\right)^2 = \frac{134832}{120000} = \frac{11236}{10000} = \left(1 + \frac{R}{100}\right)^2$

$= \left(\frac{106}{100}\right)^2 = \mathbf{6\%}$

454. Let their ages be $3x : 5x$

$3x + 5x = 80;\ 8x = 80$

$\therefore x = 10$

Ratio of their age after 10 years

$= (3x + 10) : (5x + 10) = 40 : 60 = \mathbf{2 : 3}$

455. Number of failures = 50% of 1100 + 60% of 900

$= \frac{50}{100} \times 1100 + \frac{60}{100} \times 900 = 1090$

Required Percentage $= \frac{1090}{2000} \times 100 = \mathbf{54.5\%}$

456. $\frac{392}{\sqrt{x}} = 28 \Rightarrow \sqrt{x} = \frac{392}{28} = \mathbf{144}$

457. Required length = HCF of 900, 495 and 1665

$= \mathbf{45}$ cm

458. Cost price $= 5060 \times \frac{100}{110} = \text{Rs. } \mathbf{4600}$

459. $30 \times \frac{100}{100+50} = \mathbf{20\ Oranges}$

460. Interest = Rs. 15,767.50 – 8500 = Rs. 7267.50

$\frac{7267.50 \times 100}{8500 \times 4.5} = \mathbf{19\ years}$

461. Perimeter of Semi circle = $\pi r + d$

$= \frac{22}{7} \times \frac{63}{2} + 63 = \mathbf{162\ cm}$

462. $\frac{31}{10} \times \frac{3}{10} + \frac{7}{5} \div 20 = \frac{31 \times 3}{10 \times 10} + \frac{7}{5} \times \frac{1}{20} = \mathbf{1}$

463. $\frac{\sqrt{625}}{11} \times \frac{14}{\sqrt{25}} \times \frac{11}{\sqrt{196}} = \frac{25}{11} \times \frac{14}{5} \times \frac{11}{14} = \mathbf{5}$

464. $3 \div \left[3 \div \left\{2 \div \frac{34}{13}\right\}\right]$

$\Rightarrow 3 \div \left[3 \div \frac{26}{34}\right] \Rightarrow 3 \div \frac{3 \times 34}{26} \Rightarrow \frac{3 \times 26}{3 \times 34} \Rightarrow \frac{13}{17}$

465. $\sqrt{7 \times 28} = \sqrt{196} = \mathbf{14}$

466. A alone takes = $\frac{1}{36}$ hours; B = $\frac{1}{45}$ hours

$\therefore$ A + B = $\left(\frac{1}{36} + \frac{1}{45}\right) = \frac{9}{180} = \frac{1}{20}$

467. $36 \times \frac{5}{18} = 10$ m/sec

Required time = $\frac{100}{10} = \mathbf{10\ sec.}$

468. ? % of 73 – 51% of 48 = 26.62

$\therefore$?% of 73 = 26.62 + 24.48 = 51.10

$\therefore$? = $\frac{51.10 \times 100}{73} = \mathbf{70}$

469. 15.27 – 27.15 + 42.68 – 68.42 + 100.20 = ?

= 62.58

481. $3\frac{2}{3} - 8\frac{1}{5} + 4\frac{5}{6} - 5\frac{?}{10} + 5\frac{1}{5} = 0$

$\therefore 5\frac{?}{10} = (3 - 8 + 4 + 5) + \left(\frac{2}{3} - \frac{1}{5} + \frac{5}{6} + \frac{1}{5}\right) = 4\frac{45}{30}$

$\therefore 5\frac{?}{10} = 5\frac{1}{2} = 5\frac{5}{10} \Rightarrow ? = \mathbf{5}$

482. 230% of 55 = 110% of ? $\Rightarrow$?

$= \frac{230 \times 55}{110} = \mathbf{115}$

483. 21548 – 18372 = 15849 – ?

$\Rightarrow$? = 15849 – 3176 = **12673**

484. 65% of 220 – 35% of 280 + ? = 200

$\therefore$? = 200 – 143 + 98 = **155**. This answer is not given in any of the options. Hence, the correct choice is "None of these"

485. 2.14 × 3.1 = 4.28 × 6.2 = ?

= 6.634 + 26.536 = **33.17**

486. $\frac{10.396}{0.23} + \frac{1139.9}{4.1} = ?$

= 45.2 + 278 = **323.2**

487. $\frac{1 \div 3}{4 \div 5} = \frac{0.4}{?} \Rightarrow ? = \frac{0.4 \times (4 \div 5)}{(1 \div 3)} = \mathbf{0.96}$

488. 8917 × (113 + 87) = 8917 × 200 = **1783400**

489. We have **(i)** (5 ÷ 8) = 0.625, **(ii)** (7 ÷ 12) = 0.5833 ..... and **(iii)** (13 ÷ 15) = 0.8666 .... Thus, the required ascending order of fractions would be (i) (7 ÷ 12) followed by (ii) (5 ÷ 8) followed by (13 ÷ 15)

490. Required H.C.F. = product of least power = $4^2 \times 5 \times 6 = \mathbf{480}$

491. 421 × 0.9 + 130 × 101 = 378.9 + 13130

= 13508.9

492. $4024 + 1632 + 1496 \times \frac{15}{100} = \mathbf{5880.4}$

493. $\frac{(75.8)^2 - (55.8)^2}{20}$

$= \frac{(75.8 + 55.8)(75.8 - 55.8)}{20}$

$= \frac{131.6 \times 20}{20} = \mathbf{131.6}$

494. $\frac{4 - \sqrt{0.04}}{4 + \sqrt{0.4}} = \frac{4 - 0.2}{4 + 0.2} = \frac{3.8}{4.2} = \mathbf{0.904}$

495. 21 = 3 × 7, 36 = 2 × 2 × 3 × 3,

66 = 3 × 2 × 11

LCM = 2 × 2 × 3 × 3 × 7 × 11

Least perfect square divisible by 21, 36, 66 will be 2 × 2 × 3 × 3 × 7 × 7 × 11 × 11

= 213444

496. $\left(\frac{1}{2}\right)^{-\frac{1}{2}} = \left(2^{-1}\right)^{-\frac{1}{2}} = 2^{\frac{1}{2}} = \sqrt{2}$

497. $1+\frac{1}{1+\frac{1}{3}} = 1+\frac{3}{4} = \frac{7}{4}$

498. $\sqrt{2209} = \mathbf{47}$

499. Let the selling price be Re. 1 per metre

$\therefore$ selling price for 33 metres = Rs. 33

Profit = Rs. 11

$\therefore$ Cost price = Rs. 22; selling price = Rs. 33

Profit : **50%**

500. Selling price = Rs. 76, profit = 52%

Cost price $= \frac{76\times100}{152} = 50$

If selling price = Rs. 75 then gain = **50%**

501. Let the cost price (C.P.) of one article be Re.1

$\Rightarrow$ C.P. of 10 articles = Rs. 10

Selling price (S.P) of 9 articles = Rs. 10

$\therefore$ S.P. of 10 articles = Rs. $\frac{100}{9}$

$\therefore$ Profit % $= \frac{\frac{100}{9}-10}{10}\times100$

$= \frac{100}{9} = \mathbf{11\frac{1}{9}\%}$

502. $\frac{55\times50+60\times55+45\times60}{5+60+45}$

$= \frac{2750+3300+2700}{160} = \frac{8750}{160} = \mathbf{54.685}$

503. $\frac{20\times12+5\times7}{25} = \frac{275}{25} = \mathbf{11\ years}$

504. Correct average $= \frac{56\times20-64+61}{20} = \mathbf{55.85}$

505. 90 – 40% of 90 = **54**

507. Area is 625 km. $\therefore$ Each side of the field = 25 km

Perimeter of the field = 100 km. $\therefore$ The horse will take 10 hrs. to run around the field.

508. Inner circumference

$= 2\pi r = 2\times\frac{22}{7}\times x = \frac{44x}{7}$

$\therefore \frac{44x}{7} = 440 \Rightarrow x = 70$

Radius of the outer circle = 70 + 14 = **84 m**

509. The sides of a triangle given are 5, 12 & 13 cm

$13^2 = 12^2 + 5^2$ (Pythagoras Theorem)

Area of the $\Delta = \frac{1}{2}\times12\times5 = 30$ sq.cm

510. Remaining solution = 7.5 litres contains 300 gm of salt

$= \frac{0.300}{7.5}\times100 = \mathbf{4\%}$

511. $\pi r^2 = 2464$

$\Rightarrow r^2 = \frac{2464\times7}{22} = 784$

$r = 28$, $\therefore$ **D = 56m**

512. $\frac{1}{20}+\frac{1}{30} = \frac{1}{12}$ of the tank is filled in one minute.

Time taken by both the pipes to fill the tank

$= \frac{20\times30}{20+30} = \frac{600}{50} = \mathbf{12\ minutes}$

513. $\frac{1}{10}+\frac{1}{15} = \frac{1}{6}$ of the work is completed in two days.

$\therefore$ The whole work will be completed in **12 days.**

515. $\sqrt{?} + 66.4 = 2000 \div 25$

$\sqrt{?} = 80 - 66.4 = 13.6 = (13.6)^2 = \mathbf{184.96}$

516. $? \times 6 = 1920 - 960 = 960$

$? = \frac{960}{6}Q = 160$

$? = \mathbf{160}$

518. $2^{\frac{1}{3}}\times2^{\frac{1}{2}}\times3^{\frac{1}{3}}\times3^{\frac{1}{2}} = ?$

$2^{\frac{5}{6}}\times3^{\frac{5}{6}} = 6^{\frac{5}{6}}$

519. 10% of 4698 + 134 + 129.6

$= 4961.6\times\frac{10}{100} = \mathbf{496.16}$

521. $1+\frac{1}{1+\frac{4}{3}}=1+\frac{3}{7}$

$=\frac{10}{7}=$ **1.428**

523. $\sqrt{\frac{0.361}{0.00169}}\times\sqrt{\frac{361}{1.69}}$

$=\sqrt{213.60}\times\sqrt{213.60}$

$= 14.61 \times 14.61 =$ **213.45**

524. $\frac{2x^2-2x-4x+4-2x-4}{x^2-4}=0$

$= 2x^2 - 8x = 0$

$= x^2 - 4x = 0$

$= x(x-4) = 0$

x = 4, x = 0

525. Speed in still water $= \frac{1}{2}(12+4) =$ **8 kmph**

526. $S=\frac{D}{T}$

Distance = Length of the train (+) length of the platform

= 120 + 330 = 450

Time taken = 30 seconds

∴ m/sec is 450/30 = **15 m/sec**

527. Average speed = 2xy/x+y

$=\frac{2+60+70}{60+70}=$ **54.5 km/hr**

528. Height of the tree = 8 x

Shadow length = 5/25

$=\frac{25}{5}\times 8 =$ **40 m**

529. Increase in Average weight = 1 kg

Increase in total weight = 45 × 1 = 45

∴ The weight of the new boxer is 45 + 55 = **100 kg**

531. $SI=\frac{PRT}{100}=365$

(ie.) Re. 1 per day is Rs. 365 (for a year)

$=\frac{365\times5\times1}{100}=\frac{365\times100}{5}=$ **Rs. 7300**

532. $7^x=\frac{1}{343}=\frac{1}{7^3}=7^{-3} \Rightarrow$ **x = –3**

533. Let the runs scored in the 11th innings be 'x'.

$= 10 \times 50 + x = 11 \times 52 = 500\ x = 572$

x = 572 – 500 = **72 runs**

535. Area of a regular hexagon

$=3\frac{\sqrt{3}}{2}\times(\text{side})^2$

$=3\frac{\sqrt{3}}{2}\times 1 =3\frac{\sqrt{3}}{2}$ **cm²**

536. $\pi r^2 h = 9\pi h$

$r^2 = 9 \quad r = 3$ m

Diameter = 2 × 3 = **6 m**

537. 25% of the candidates failed

∴ 75% of them have passed

∴ 75% of candidates is = 450

Number of appeared candidates

$=\frac{450\times100}{75}=$ **600**

538. $\frac{r}{100-r}\times100=\frac{10}{100-10}\times100$

$=\frac{10}{90}\times100=$ **11.11%**

539. 0.628 × ? = 0.314 ÷ 0.2 = 1.57

? = 1.57 ÷ 0.628 = **2.5**

540. $(0.75)^2 + (0.5)^2 = ?^2 + (0.05)^2$

$= 0.5625 + 0.25 = 0.8125$

$\therefore ?^2 = 0.8125 - 0.0025 = 0.81 = (0.9)^2$

$\Rightarrow ? =$ **0.9**

541. 43% of 20 + 65% of 30 = ?

= 8.6 + 19.5 = **28.1**

542. 63.126 + 36.39 – 42.58 + 1.008 – 36.631 = ?

= 21.313

543. $2\frac{1}{5}\div1\frac{3}{5}\div3\frac{2}{5}=1\div?=\left(\frac{11}{5}\times\frac{5}{8}\right)\times\frac{5}{17}=\frac{55}{136}$

∴ ? = 1 ÷ (55 ÷ 136) = 1 × (136 ÷ 55)

= **136 ÷ 55**

544. Let the smaller number be "X" and the larger number be "Y". Thus, we get,

$X^2+Y^3=778$ and $Y^2=X+74 \Rightarrow X = Y^2 - 74$

$\therefore (Y^2 - 74)^2 + Y^3 = 778$

$\Rightarrow Y^4 + Y^3 - 148Y^2 + 4698 = 0$

Solving this equation, we get, Y=9. ∴ X=7. (The equation in highter order may be attempted quickly by "trial and error method of solution.) Hence, the required sum = 9 + 7 = **16**

545. Eight years ago, Meena must be 16 years old. (24 – 8 = 16). Thus, eight years ago, Anju must be eight years old (16 ÷ 2 = 8). Thus, Anju must be 16 years old today. (8 + 8 = 16).

546. Required sum = 8% of 630 + 12% of 315 = **88.2**

547. When the difference in the numerator and denominator figures is constant, the fraction with the largest value could lie towards the larger number. Obviously, the answer is **9/11**.

548. Let the age of the mother and her daughter be "X" and "Y" years respectively today. Thus, [(X +Y) ÷ 2] = 34.5

$\Rightarrow$ (X + Y) = 69. Further, Y = X ÷ 2 $\Rightarrow$ X = 2Y

$\Rightarrow$ 3Y = 69 $\Rightarrow$ Y = 23. Thus, **X = 46 years**

549. By Hypothesis, 30 % of A=0.25 of B= $\frac{1}{5}$ of C

or $\frac{30}{100}\times A=\frac{25}{100}\times B=\frac{1}{5}\times C$

or $\frac{3}{10}A=\frac{1}{4}B=\frac{1}{5}C$ or $\frac{A}{10}=\frac{B}{12}=\frac{C}{15}$

Hence, A:B:C = **10:12:15**

550. Suppose one part is = Rs. x ∴ Other part = Rs. (1440 – x)

By hypothesis, $1440 - x = \frac{7}{9}x$

or 12960 – 9x = 7x

or 16x = 12960 ∴ x = 810

Hence, the smaller part = Rs.(1440 – 810)

= **Rs.630**

551. Suppose father's age = x years

∴ Son's age = 60 – x

By hypothesis,

x – 6 = 5 (60 – x – 6) = 270 – 5x

or 6x = 276. ∴ x = 46

Hence, six years hence son's age would be = 60–x+6=66 – 46 = **20 years**

552. Suppose C.P. of article = Rs. x Loss = 29 %

∴ C.P. of article = Rs. $x \times \frac{100-29}{100}$

= Rs. $x\ \frac{71}{100}$

If the article was sold for Rs.84 more,

New S.P. = Rs. $\left(\frac{71}{100}x+84\right)$

Then, profit % = $\frac{\frac{71}{100}x+84-x}{x}\times 100$

By hypothesis,

$\frac{8400-29x}{100x}\times 100 = 11$

or 8400–29x=11x

or 40x=8400 or x = **Rs.210**

553. Average speed of total journey

= H.M. of 20 km/hr and 30 km/hr

= $\frac{2\times 20\times 300}{20+30}=\frac{1200}{50}$ = **24 km/hr.**

554. S.P. of retailer = Rs.3375. His profit = 25 %

C.P. of retailer

= Rs. 3375 × $\frac{100}{100+25}$

=Rs. 3375 × $\frac{100}{125}$ = Rs. 2700

or S.P. of wholesaler = Rs.2700. Since his profit = 20%. Hence, wholesaler's C.P.

= Rs.2700× $\frac{100}{100+20}$ = Rs.2700× $\frac{100}{120}$

= **Rs.2250**

555. Given Exp.

= $\frac{2}{3}\div 7\frac{1}{2}$ of $\frac{4}{9}+99\frac{48}{49}\times 245$

= $\frac{2}{3}\div\left(\frac{15}{2}\times\frac{4}{9}\right)+\frac{4899}{49}\times 245$

= $\frac{2}{3}\div\frac{10}{3}+24495=\frac{2}{3}\times\frac{3}{10}+24495$

= $\frac{1}{5}$ + 24495 = 24495.2

= **24,500** (approx.)

556. A's 1 day's work $= \frac{1}{9}$

B's 1 day's work $= \frac{1}{18}$

$\therefore$ (A+B)'s 1 day's work $= \frac{1}{9}+\frac{1}{18}=\frac{3}{18}=\frac{1}{6}$

Suppose total time taken = x days

$\therefore$ A+B worked for (x – 3) days

$\therefore$ (A+B) (x – 3) days work $= \frac{x-3}{6}$

Now, in rest of the days B only works

$\therefore$ B's 3 days' work $= \frac{3}{18}=\frac{1}{6}$

Thus, $\frac{x-3}{6}+\frac{1}{6}=1$

or $\frac{x-2}{6} = 1$ or $x-2=6$ or **x=8 days**

557. Given that $\frac{A}{\frac{1}{2}}=\frac{B}{\frac{1}{3}}=\frac{C}{\frac{1}{4}}$

or 2A=3B=4C

or $\frac{2A}{12}=\frac{3B}{12}=\frac{4C}{12}$

or $\frac{A}{6}=\frac{B}{4}=\frac{C}{3}$

Sum of ratios = 6+4+3=13. Suppose total amount is Rs.x

By hypothesis, $\frac{6}{13}\times x-\frac{1}{13}\times x=400$

$\frac{2}{13}x=400$

$\therefore x=\frac{400\times 13}{2}$ = **Rs. 2600**

558. Suppose length of pole = x m

Portion of pole dipped in mud $=\frac{1}{6}x$ m

$\therefore$ Remaining portion of pole $x-\frac{x}{6}=\frac{5}{6}x$ m

$\therefore$ Portion of pole dipped in water $=\frac{1}{2}\times\frac{5}{6}x=\frac{5}{12}x$ m

$\therefore$ Portion of pole outside mudded water

$=x-\left(\frac{x}{6}+\frac{5}{12}x\right)=x-\frac{7}{12}x=\frac{5}{12}x$

By hypothesis,

$\frac{5}{12}x=5$ or **x = 12 m**

559. Suppose a person walks x km in t hours

By hypothesis,

$\frac{x}{t}=10$ or x = 10 t.....(i)

and $\frac{x+20}{t}=14$ or x + 20 = 14t....(ii)

Substituting the value of t from (i) in (ii)

$x+20=14\left(\frac{x}{10}\right)$

or 10x + 200 = 14x or 4x = 200

$\therefore$ **x = 50 km.**

560. $\left(\sqrt{3}-\frac{1}{\sqrt{3}}\right)^2$

$=\left(\sqrt{3}\right)^2+\frac{1}{\left(\sqrt{3}\right)^2}-2\sqrt{3}.\frac{1}{\sqrt{3}}$

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

561. If r cm be the radius of the circle, then by hypothesis,

$\pi r^2=616$ or $r^2=\frac{616}{\pi}=\frac{616\times 7}{22}=196=14^2$

$\therefore$ **r = 14 cm**

562. Common difference between the consecutive terms of the series is 3.

$\therefore$ 2nd term = 1st term + 3 = 1 + 3 = 4

3rd term = 2nd term + 3 = 4 + 3 = 7

4th term = 3rd term + 3 = 7 + 3 = 10

Hence, 5th term

= 4th term + 3 = 10 + 3 = **13**

563. Using the formula, $\frac{C}{5}=\frac{F-32}{9}$

When C = 35,

$\frac{35}{5}=\frac{F-32}{9}$ or $7=\frac{F-32}{9}$ or F – 32 = 63

$\therefore$ F = 63 +32 = **95°F**