(A) Time & Distance (Answers)

1. (b) $(20-8)$ sec $= 180$ m
$\Rightarrow$ 12 sec $= 180$ m
$\Rightarrow$ 1 sec $= 15$ m

$\therefore$ Speed $= 15$ m/sec
$= \left(\cancel{15}^{3} \times \frac{18}{\cancel{5}}\right)$ km/hr
$= \boxed{54 \text{ km/hr}}$

2. (d) Relative speed $= (36+45) = 81$ km/hr
$\therefore$ 81 K/hr $= \left(81 \times \frac{5}{18}\right)$ m/sec $= \frac{45}{2}$ m/s
Length of the train: $\left(\frac{45}{2} \times 8\right)$ m $= \boxed{180 \text{ m}}$

3. (a) Time $= \frac{2 \times 10 \times 15}{(10+15)} = \left(\frac{2 \times \cancel{10}^{2} \times \cancel{15}^{3}}{\cancel{25}_{\cancel{5}}}\right) = \boxed{12 \text{ sec}}$

4. (a) Required answer $= \left(\frac{54-45}{\cancel{54}} \times 60\right)$ min $= \boxed{10 \text{ min}}$

5. (c) Speed of the return speed $= \left(40 + \frac{40 \times 50}{100}\right) = 60$
$\therefore$ Average speed: $\left(\frac{2 \times 40 \times 60}{100}\right)$ K/h $= \boxed{48 \text{ K/h}}$

6. (c) Distance covered in first 2 hrs: $(70 \times 2) = 140$ km
$\therefore$ Distance covered in next 2 hours $= (80 \times 2) = 160$ km
Remaining distance $= \{345 - (140+160)\} = 45$ km
$\therefore$ Speed in the 5th hour $= 90$ km/hr
$\therefore$ Time taken to cover 45 km $= \frac{45}{90} = \frac{1}{2}$ hr
$\therefore$ Total time taken $= \left(2 + 2 + \frac{1}{2}\right) = \boxed{4\frac{1}{2} \text{ hrs}}$

7. (a) Speed Ratio $\rightarrow 4:3:5$
$\therefore$ Time Ratio $\rightarrow \frac{1}{4} : \frac{1}{3} : \frac{1}{5}$
$\boxed{15 : 20 : 12}$

8. (c) Number of gaps between 21 telephone posts = 20 distance traveled in 1 minute = (50×20)

$= 1000\,m = 1\,km$

$\therefore$ speed $= (60 \times 1) \Rightarrow$ **60 km/hr**

9. (c) Let the speeds of two trains be x m/sec and y m/sec respectively. Then, length of the first train $= 27x$ m; the length of the second train $= 17y$ m.

$\therefore$ speed $= \dfrac{\text{Distance}}{\text{Time}}$

$$(x+y) = \frac{(27x+17y)}{23}$$

$\Rightarrow 23x + 23y = 27x + 17y$

$\Rightarrow 4x = 6y$

$\Rightarrow x : y = \boxed{3:2}$

10. (c) Suppose they meet x hrs after 8 am.

Then, [Distance moved by first in x hrs] + [Distance moved by second in $(x-1)$ hrs] $= 330$

$\therefore 60x + 75(x-1) = 330$

$\Rightarrow x = 3$

So, they meet at $\rightarrow (8+3) = \boxed{11\text{ am}}$

1. (d) (Girl) (100×2.6) 260 — (Boy) (100×1.8) 180

236

56 : 24

7 : 3

No. of girls :→ $\left(\frac{7}{10} \times 50\right) = \boxed{35}$

2. (c) (W) 0 — (M) 12

8

4 : 8

1 : 2

∴ Ratio of Water and Milk $= \boxed{1:2}$

3. (a) (Spirit) 30 — (Spirit) 100

80

20 : 50

2 : 5

∴ Required ratio → $\boxed{2:5}$

4. (b) 80% Silver $= \frac{4}{5}$ th part.

(Silver) $\frac{5}{6}$ — (Silver) $\frac{7}{9}$

$\frac{4}{5}$

$\frac{1}{45}$: $\frac{1}{30}$

30 : 45

$\boxed{2:3}$

5. (a) (A) 30 — (B) 40

x

$(40-x)$: $(x-30)$

$\therefore \frac{(40-x)}{(x-30)} = \frac{4}{7}$

$\Rightarrow 280 - 7x = 4x - 120$

$\Rightarrow 11x = 400$

$\boxed{x = 36.6}$

6. (d) (a) (b)

10 — 12 — 16

4 : 2

2 : 1

∴ Quantity sold at 16% profit

$\left(2500 \times \frac{1}{3}\right) = \boxed{833.33\,kg}$

7. (c) CP of mixture $= \frac{100}{110} \times \frac{1030}{100} = 9.36$

(1st) (2nd)

10 — 9.36 — 9

0.36 : 0.64

9 : 16

∴ $9x$ [redacted] $= 36$

$x = \frac{36}{9}$ [redacted] 4

$4x$ = [redacted] $\boxed{16}$

8. (c) Bus (1st) Car (2nd)

12 — 10 — 7 $\left(\because \frac{50}{5} = 10\right)$

3 : 2

Bus $= \left(\frac{3}{5} \times 50\right)$ km

$= \boxed{30\,km}$

9. (d) Amount of petrol left $= 500\left(1 - \frac{50}{500}\right)^4$

$= 500 \times \left(\frac{9}{10}\right)^4 \Rightarrow \left(\frac{500 \times 6561}{10000}\right) \Rightarrow 328.05$

∴ Amount of kerosene $= (500 - 328.05) = \boxed{171.95\,litr}$

10. (a) (A) (B)

$\frac{9}{16}$ — $\frac{9}{17}$ — 0

$\frac{9}{17}$: $\frac{9}{16} - \frac{9}{17}$

$\frac{1}{17}$: $\frac{1}{16 \times 17}$

16 : 1

∴ 1 = 8 litrs.

16 = 128 litrs.

Now, A was contained by the can initially

$= \left(\cancel{128}^{8} \times \frac{9}{\cancel{16}}\right) = \boxed{72\,litrs}$

[C] LCM & HCF (ANSWERS) <15>

1. (d) HCF of 12, 16 and 24 = $\boxed{4\,m}$

2. (d) LCM of 7, 7 and 12 = $\boxed{252}$

3. (b) LCM of (15, 12, 21) = 420

∴ 420 sec = 7 minutes

4. (b) HCF of $\{(427-3);\ (900-8)\} \Rightarrow (424, 892) = \boxed{4}$

5. (d) HCF is 8.

∴ The numbers are 8x and 8y.

According to the question:

$(8x + 8y) = 128$

$\Rightarrow x + y = 16$

	x	y
(i)	15	1
(ii)	13	3
(iii)	11	5
(iv)	9	7

$\boxed{4 \text{ pairs}}$

(b) Let the numbers are x and y.

$x + y = 80 \rightarrow (i)$ $\quad xy = (5 \times 275) = 1375$

Sum of reciprocals $= \left(\frac{1}{x} + \frac{1}{y}\right) \Rightarrow \frac{x+y}{xy} = \boxed{\frac{80}{1375}}$

(a) HCF = Product of the 2 numbers / LCM

$= \left(\frac{xy}{z}\right)$

(a) $\frac{\text{HCF of numerators}}{\text{LCM of denominator}} = \boxed{\frac{4}{126}}$

) Other number = $(7700 \times 11)/275 = \boxed{308}$

) Required number : (LCM of 12, 15, 20, 54) + 8

$= (540 + 8)$

(II) COMPOUND INTEREST (ANSWERS) <16>

1. (c) $SI = \frac{200 \times CI}{(200+R)} \Rightarrow$ [redacted] $90 = \frac{200 \times CI}{210} = \boxed{₹ 99.5}$

2. (c) $P = \frac{48 \times (100)^3}{400 \times 320} \Rightarrow \frac{48 \times 1000 \times 100}{400 \times \frac{320}{2}} \Rightarrow \boxed{₹ 375}$

3. (d) $P = 16 \times \left(\frac{100}{5}\right)^2 \Rightarrow P = ₹ 6400$

$\therefore SI = \left(\frac{6400 \times 5 \times 2}{100}\right) = \boxed{₹ 640}$

4. (d) $5984 = P\left[\left(1+\frac{20}{100}\right)^2 - 1\right] \Rightarrow P = 13600$

$\therefore SI = \frac{13600 \times 9 \times 6}{100} = \boxed{₹ 7344}$

5. (c) $R = \left[\frac{1080-900}{900} \times 100\right] = \boxed{20\%}$

6. (c) $15625\left(1+\frac{8}{200}\right)^{2n} = 17576$

$\Rightarrow 15625\left(\frac{104}{100}\right)^{2n} = 17576$

$\Rightarrow \left(\frac{26}{25}\right)^{2n} = \frac{17576}{15625}$

$\Rightarrow \left(\frac{26}{25}\right)^{2n} = \left(\frac{26}{25}\right)^3$

$\Rightarrow 2n = 3$

$\Rightarrow n = \frac{3}{2} \Rightarrow n = \boxed{1\frac{1}{2} \text{ yrs}}$

7. (b) Sum $= 642\left[\left(\frac{100}{104}\right) + \left(\frac{100}{104}\right)^2\right]$

$= \left(642 \times \frac{26}{26} \times \frac{51}{26}\right) \Rightarrow ₹\ 1210.9$

$= \boxed{₹\ 1211}$

8. (c) $A = 7000 \times \frac{105}{100} \times \frac{107}{100} \times \frac{110}{100}$

$= 8650.95 \approx ₹\ 8651$

$\therefore$ C.I $= (8651 - 7000) = \boxed{₹\ 1651}$

9. (d) In S.I :→ Let $P = ₹100$; $A = ₹150$

$\therefore I = ₹50$ and $T = 5$ yrs

$\therefore R = \left(\frac{100 \times 50}{100 \times 5}\right) = 10\%$

Now, in CI : $P = 12000$; $T = 3$ yrs ; $R = 10\%$

$\therefore$ C.I $= 12000\left[\left(1 + \frac{10}{100}\right)^3 - 1\right]$

$= (12 \times 331)$

$= \boxed{₹\ 3972}$

10. (a) $\left\{500 \times \left(\frac{110}{100}\right)^3\right\} + \left\{500 \times \frac{110}{100}\right\}^2 + \left\{500 \times \frac{110}{100}\right\}$

$= 500\left[\left(\frac{11}{10}\right)^3 + \left(\frac{11}{10}\right)^2 + \left(\frac{11}{10}\right)\right]$

$= 500 \times \frac{11}{10}\left[\left(\frac{11}{10}\right)^2 + \frac{11}{10} + 1\right]$

$= 500 \times \frac{11}{10} \times \frac{331}{100}$

$= \boxed{1820.5}$

(E) SIMPLIFICATION (ANSWERS) <18>

1/ (a) $\sqrt{8837} \times 20 \times 4.25 + \sqrt{5040} \times 10 \times 8.75 - \sqrt{4489} \times 5 \times 1.25$

$= \sqrt{8836} \times 20 \times 4 + \sqrt{5041} \times 10 \times 9 - \sqrt{4489} \times 5 \times 1$

$= 94 \times 80 + 71 \times 90 - 67 \times 5 \times 1$

$= 7520 + 6390 - 335$

$= \boxed{13575}$

2. (c) $0.003 \times 0.9 \times 0.005 \times 0.2 + 0.008 \times 0.5 + 25.85 - 23.05$

$= 0.0027 \times 0.0001 + 0.0004 + 25.85 - 23.05$

$= 0.00000027 + 0.0004 + 2.8$

$= 2.8040027 \approx \boxed{3}$

3. (c) $(2356.237 \times 4.9) - 1357.895 + 1124.237 - 425.331 + (35 \times 1.23)$

$= (2356 \times 5) - 1358 + 1124 - 425 + (35 \times 1)$

$= 11780 - 1358 + 1124 - 425 + 35$

$= 11780 + 1124 + 35 - 1358 - 425$

$= (12939 - 1783)$

$= \boxed{11156}$

(E) SIMPLIFICATION (ANSWER):

1 (b) $470.005 \times 99.92 + 337.89 + 472.05 - 137.88 \times 0.98$

$= 470 \times 100 + 338 + 472 - 138 \times 1$

$= 47000 + 810 - 138$

$= \boxed{47672}$

5. (c) $2222.1 \times 11 + 3333.1 \times 11.01 + 4444 \times 11 + 5555 \times 11 - 6666.1 \times 11 = ?$

$= (2222 \times 11) + (3333 \times 11) + (4444 \times 11) + (5555 \times 11) - (6666 \times 11)$

$= 11[2222 + 3333 + 4444 + 5555 - 6666]$

$= 11 \times 1111 [2 + 3 + 4 + 5 - 6]$

$= (11 \times 1111 \times 8) \Rightarrow \boxed{97768}$

6 (a) $(50)^3 \div (25)^2 + 2466 = ?$

$= \frac{50 \times 50 \times 50^2}{25 \times 25} + 2466$

$= \boxed{2666}$

7 (c) $(7.84)^{\frac{1}{2}} \times (47.61)^{\frac{1}{2}} - (9216)^{\frac{1}{2}} = ?$

$= \sqrt{\frac{784}{100}} \times \sqrt{\frac{4761}{100}} - \sqrt{9216}$

$= (2.8 \times 6.9) - 96$

$= 19.32 - 96$

$= \boxed{-76.68}$

(E) SIMPLIFICATION (ANSWERS) <20>

8 (b) $78 \times (1024)^{\frac{1}{2}} \div ? = 208$

$\Rightarrow \dfrac{\cancel{78}^{6} \times \cancel{32}^{2}}{\cancel{208}_{13}} = x$

$\Rightarrow x = \boxed{12}$

9 (d) 20% of $650 + 150\% \cdot ? = 2005$

$\Rightarrow \dfrac{650}{5} + \dfrac{150x}{100} = 2005$

$\Rightarrow \dfrac{150x}{100} = (2005 - 130)$

$\Rightarrow \dfrac{3x}{2} = 1875$

$\Rightarrow x = \boxed{1250}$

10 (b) $\dfrac{3}{2} + \dfrac{8}{7} \times \dfrac{42}{5} \div \dfrac{4}{3}$

$= \cancel{\dfrac{3}{2} + \dfrac{8}{7} \times \dfrac{42}{5} \times \dfrac{3}{4}}$

$= \dfrac{3}{2} + \dfrac{8}{\cancel{7}} \times \dfrac{\cancel{42}^{\cancel{21}\,3}}{5} \times \dfrac{3}{\cancel{4}_{2}}$

$= 1.5 + 7.2$

$= \boxed{8.7}$