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Quantitative Aptitude

SOLUTIONS

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INDEX

Number System

LEVEL OF DIFFICULTY-1

1. (*c*) 856973

P.V of 6 = 6000
F.V. of 6 = 6
Difference = 5994

2. (*c*) 69758472

P.V. of 7 = 700000
P.V. of 7 = 70
= 699930

3. (*a*) $784 \times 618 \times 917 \times 463$

Unit digit = $\frac{U_n}{V_n}$ 4×8 $\times$ 7×3 32 $\times$ 21 $2\times1=2$

Take only unit place.

4. (*c*) 517 * 324 ÷ 3

∴ Sum of digits 22 + * = 24

∴ ? = 2

Take next multiple of 3.

5. (*d*) Divisible by 99 means 11 × 9

(*a*) 3572404 (*b*) 135792 (*c*) 913464 (*d*) 114345

25	27	27	18
NA	Odd place (1 + 3 + 9	(9 + 3 + 6)	(1 + 4 + 4)
	– (3 + 7 + 2)	– (1 + 4 + 4)	– (1 + 3 + 5)
	= 15 – 12 = 3	18 – 9 = 9	9 – 9 = 0

Divisibility of 9 is sum of digits divisible by 9.

Divisibility of 11 is sum of odd place – Sum of even place = 0 or multiple of 11.

So (*d*) is the answer whih satisfies both of conditions.

6. (*e*) $4864 \times 4p_2 \div 12$

12 can be grouped as 4 × 3 or 3 × 4

4864 is divisible by 4 because last two digits are divisible by 4

$4p2 \div 3$ (Sum of digits divisible by 3)

6 + P = 6

$p = 0$

7. (*d*) Sum of odd place – Sum of even places = 0 or 11 (Divisibility rule of 11)

(*a*) 235641= 11 – 10 = 1

(*b*) 245642= 11 – 12 = – 2

(*c*) 315624= 10 – 11 = – 1

(*d*) 415624= 11 – 11 = 0

8. (*d*) Sum of Ist five prime nos.

Sum = 2 + 3 + 5 + 7 + 11 = 28

9. (*a*) $1056 \div 23 = 45 \times 23 + 21$

$23\overline{)1056}(45$
92
136
115
21

∴ $21 + p = 23$

∴ Required No. is 23 – 21 = 2

10. (*b*)

Divisible by	3	9	11
Sum of digits 639 = 18	√	√	15 – 3 = 12 ×
Sum of digits 2079 = 18	√	√	9 – 9 = 0 √
Sum of digits 3791 = 20	×	×	×
Sum of digits 37911 = 21	√	×	×

Now divide by 7 √

Note :
3 = Sum of digits ÷ 3
9 = Sum of digits ÷ 9
11 = 1 sum of odd place – sum of even place = 0

11. (*b*) No = Division × Quotient + Remainder
$= 56 \times x + 29$
By 8 $= (7 \times 8 \times x + 0) + (8 \times 3 + 5)$
$= 8(7x + 3) + 5$

∴ Remainder is 5.

Short cut = 56 × 1 + 29 Take the quotient as 1
= 85 ÷ 8 = 8 × 10 + 5
- Remainder is 5

12. (*a*)

4	214
5	53 + 2
6	10 + 3
	1 + 4

Steps : 1. Take last Quotient 1

2. $1 \times 6 + 4 = 10$

3. $10 \times 5 + 3 = 53$

4. $53 \times 4 + 2 = 214$

or Chooese from option

$214 \div 4 = 53 \times 4 + 2$

$53 \div 5 = 10 \times 5 + 3$

$10 \div 6 = 1 \times 6 + 4$

In answer is 214.

13. (*b*) Even integers consecutive $x, x + 2$

$(x + 2)^2 - (x)^2$

$= x^2 + 4x + 4 - x^2$

$= 4(x + 1)$ So 4 is the answer.

14. (*c*) Smallest 6 digit no. 100000

$$111\overline{)100000}\ (900$$
$$999$$
$$100$$

$\therefore$ No. of 100000 + (111 – 100) = 100011

15. (*b*) $(10^n - 1)$ divisible by 11

Take $x = 1, 2, 3, 4$

$10^1 - 1 = 10 - 1 = 9 \times$

$10^2 - 1 = 100 - 1 = 99 \surd$

$10^3 - 1 = 1000 - 1 = 999 \times$

$10^3 - 1 = 10000 - 1 = 9999$

So n is even integer.

16. (*b*) $(6)^{15} \times (10)^5 \times (15)^6 = 2^x \times 3^y \times 5^z$

$2^{15} \times 3^{15} \times 2^5 \times 5^5 \times 3^6 \times 5^6$

$2^{10} \times 3^{21} \times 5^{11} = 2^x \times 3^y \times 5^2$

$\therefore \quad x + y + z = 20 + 21 + 11 = 52$

17. (*d*)

2	19404
2	9702
3	4851
3	1617
7	539
7	77
11	11
	1

$\therefore 2^2 \times 3^2 \times 7^2 \times 11$

It should be multiplied by 11 to make it perfect square.

18. (*b*) We must take options and both conditions should be satisfied.

	(*a*) 48	(*b*) 42	(*c*) 56	(*d*) 81
Sum 12	6	11	9	
	NA		NA	NA

On subtracting 42 – 18 = 24. Which is interchanged

LEVEL OF DIFFICULTY-2

1. (d)

$$\begin{array}{ccc} 5 & A & 7 \\ 3 & 3 & 5 \\ \hline 8 & B & 2 \end{array}$$

$\Rightarrow A \rightarrow 1, 2, 3, 4, 5, \&$

$B \rightarrow 5, 6, 7, 8, 9$

8B2 is exactly divisible by 3.

$\therefore 8 + B + 2 =$ multiple of 3.

$\therefore B = 5$ or 8

$\Rightarrow A = 1$ or 4.

2. (a) $1000 = (45 \times 22) + 10$

$\therefore 45 - 10 = 35$ to be added.

So, the smallest number to be added to 1000 to make the sum exactly divisible by 45 is 35.

3. (b) Here, 52 is a multiple of 13. Hence, the required remainder is obtained on dividing 45 by 13. Required remainder = 6.

4. (d) A number is divisible by 11 if the difference of the sum of digits at odd and even places be either zero or multiple of 11.

If the middle digit be 4, then 24442 or 244442 etc are divisible by 11.

5. (c) Let the fraction be x, According to the question,

$$\frac{\frac{x}{3}}{5} - x \times \frac{3}{5} = \frac{32}{75}$$

$$\Rightarrow \quad \frac{5x}{3} - \frac{3x}{5} = \frac{32}{75}$$

$$\Rightarrow \quad \frac{25x - 9x}{15} = \frac{32}{75}$$

$$\Rightarrow \quad \frac{16x}{15} = \frac{32}{75}$$

$$\Rightarrow \quad x = \frac{32}{75} \times \frac{15}{16} = \frac{2}{5}$$

Correct answer $= \frac{2}{5} \times \frac{3}{5} = \frac{6}{25}$

6. (a) Let the length of the rod be x metres. According to the question,

$$x-\left(\frac{x}{10}+\frac{x}{20}+\frac{x}{30}+\frac{x}{40}+\frac{x}{50}+\frac{x}{60}\right)=12.08$$

$$\Rightarrow x\left[1-\left(\frac{60+30+20+15+12+10}{600}\right)\right]=12.08$$

$$\Rightarrow \quad x\left(1-\frac{147}{600}\right)=12.08$$

$$\Rightarrow \quad x\left(\frac{600-147}{600}\right)=12.08$$

$$\Rightarrow \quad x\times\frac{453}{600}=12.08$$

$$\Rightarrow \quad x=\frac{12.08\times600}{453}=16\text{ m.}$$

7. (b) Let the original fraction be $\frac{x}{x+3}$.

$$\therefore \quad \frac{x+7}{x+3-2}=2$$

$$\Rightarrow \quad x+7=2x+2$$

$$\Rightarrow \quad x=7-2=5$$

$\therefore$ Required sum $= x+x+3$

$= 2x+3=10+3=13$

8. (d) Unit digit in the expansion of 25^{625}

= Unit digit in the expansion of $5^{6251}=5$

36^{528} = Unit digit in $6^{528}=6$

Now, $3^1=3$, $3^2=9$, $3^3=27$ $3^4=81$, $3^5=243$.....

$\therefore 73^{54}=73^{52}\times73^2$

$=3^2=9$

$\therefore$ Required digit= Unit's digit of the sum $5+6+9=0$

9. (d) Let the number of students be n.

So, each of n students got 2n chocolates

Total no. of chocolates

$=(2n)\times n=800$

$\Rightarrow 2n^2=800$

$\Rightarrow n^2=400\Rightarrow n=20$

10. (b) If the number of correct sums be x, then,

$x\times3-(30-x)\times2=40$

$\Rightarrow \quad 3x-60+2x=40$

$\Rightarrow \quad 5x=60+40=100$

$\Rightarrow \quad x=20$

HCF & LCM

LEVEL OF DIFFICULTY-1

1. (*a*) $2^2\times3^2\times5^5$

$2^3\times3^2\times5^2\times7$

$2^4\times3^4\times5\times7^2$

HCF $2^2\times3^2\times5$

Though it is HCF but take the power as smallest one as a common factor.

2. (*b*) Co-prime is having HCF 1.

So (18, 25) is the answer.

3. (*b*) $\text{HCF}=\frac{\text{HCF}}{\text{LCM}}=\frac{2}{3},\frac{8}{9},\frac{64}{81},\frac{10}{27}=\frac{2}{81}$

4. (*a*) $\text{LCM}=\frac{\text{LCM}}{\text{HCF}}=\frac{2}{3},\frac{3}{5},\frac{4}{7},\frac{9}{13}=\frac{36}{1}=36$

5. (*d*) $2^2\times3^2\times5\times11$

$2^4\times3^4\times5^2\times7$

$2^5\times3^3\times5^3\times7^2\times11$

LCM $=2^5\times3^4\times5^3\times7^2\times11$

Though LCM, Take high power of each number.

6. (*d*) HCF = 12

Ratio of No. 1 : 2 : 3

$\therefore$ Nos are $1\times12:2\times12:3\times12$

12; 24; 36

HCF should be factor of all the numbers.

7. (*b*)

1657	2037
−6	−5
1651	2032

By division method take HCF as greatest no.

$$1651\overline{)2032}\,(1$$
$$1651$$
$$381\overline{)1661}\,(4$$
$$1524$$
$$127\overline{)381}\,(3$$
$$381$$
$$\times$$

HCF = 127

8. (*e*) HCF = 8

So 60 can't be LCM

Because 8 is not the factor of 60.

9. (*c*) For biggest measure take HCF of 496,403,713

$$403\overline{)496}\ (1 \qquad 403 \qquad 93\overline{)403}\ (4 \qquad 372 \qquad 31\overline{)93}\ (3 \qquad 93 \qquad \times$$

$$31\overline{)713}\ (23 \qquad 62 \qquad 93 \qquad 93 \qquad \times$$

So HCF is 31 as biggest.

10. (*a*) LCM 161 (Factorise it)

$\therefore$ No. are 23×7

$\because \quad x > y \therefore x = 23, y = 7$

$3y - x = 3 \times 7 - 23 = -2$

11. (*b*) Product of two numbers = 117 (on factorising we get 13 and 9 LCM of 13 and 9 is 117)

If there are two prime numbes. So ans is 117.

12. (*d*) For regular intervals take LCM

LCM of 2, 4, 6, 8, 10 and 12 is 120 seconds

i.e. 2 minutes will be time when they would toll together.

$\therefore \quad \frac{30}{2} + 1 = 16$ times

1 is to be added because they commenced together.

13. (*e*) HCF × LCM= Product of two numbes

$x \times 36 = 3024$

$$x = \frac{3024}{36} = 84$$

14. (*b*) LCM of 48, 72 and 108 = 432 second.

$\therefore$ 7 hour 12 minutes.

Last time 8 : 20 : 00 hr.

Next time 7 : 12 hrs.

8 : 27 : 12 hrs.

LEVEL OF DIFFICULTY-2

1. (b) LCM of 20, 30 and 40 minutes = 120 minutes

Hence, the bells will toll together again after 2 hours i.e. at 1 p.m.

2. (b) The smallest number divisible = LCM of 16, 20 and 24

2	16, 20, 24
2	8, 10, 12
2	4, 5, 6
	2, 5, 3

3. (d) The LCM of 6, 12 and 18 = $36 = 6^2$

4. (a) Let the numbers be $2x$, $3x$ and $4x$ respectively.

$\therefore$ HCF = $x = 12$

$\therefore$ Numbers are : $2 \times 12 = 24$

$3 \times 12 = 36$, $4 \times 12 = 48$

LCM of 24, 36, 48

$= 2 \times 2 \times 2 \times 3 \times 3 \times 2 = 144$

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Additional and Subtraction

LEVEL OF DIFFICULTY-1

1. (*a*) $892{\cdot}7 - 573{\cdot}07 - 95{\cdot}007$

$= 892{\cdot}700 - 573{\cdot}070 - 95{\cdot}007 = 224{\cdot}623$

2. (*d*) $1 + 0{\cdot}1 + 0{\cdot}01 + 0{\cdot}001 = 1{\cdot}111$

$= 1{:}000 +$
$\cdot 100$
$\cdot 010$
$\cdot 001$
$1{\cdot}111$

3. (*a*) $\left[35\cdot 7 - \left\{3 + \frac{1}{3 + \frac{1}{3}}\right\} - \left(2 + \sqrt{12} + \frac{1}{2}\right)\right]$

$= 35\text{-}7 - \left(3 + \frac{3}{10}\right) - (2 + 3{\cdot}4 + {\cdot}5)$

$= 35{\cdot}7 - 3{\cdot}3 - 5{\cdot}9$

$= 32{\cdot}4 - 5{\cdot}9 = 26{\cdot}5$

4. (*e*) $0{\cdot}5 + 0{\cdot}55 + 0{\cdot}055 + 5{\cdot}505$

$=$ $0{\cdot}500$
$0{\cdot}550$
$0{\cdot}055$
$5{\cdot}505$
$6{\cdot}610$
or $6{\cdot}61$

5. (*a*) $495.15 + 202.05 - 314.96 - 25.55 =$

$697{\cdot}18 - 340{\cdot}51 = 356{\cdot}67$

6. (*c*) $2{\cdot}05 \times 45 + 2{\cdot}05 \times 4{\cdot}5 + 2{\cdot}05 \times 0{\cdot}45$

$2{\cdot}05\,(45 + 4{\cdot}5 + 0{\cdot}45)$

$= \frac{205}{100} \times \frac{4995}{100} = 102{\cdot}3975$

4995
205
24975
0000×
9990××
102·3975

or

$205 \times 45 = 9225$

$\therefore \frac{9225}{100} + \frac{9225}{1000} + \frac{9225}{10000}$

$=$ 92·25 / 09·225 / ·9225 / 102·3975 and 205 / 45 / 1025 / 820× / 9225

7. (*c*) $435{\cdot}43 + 43{\cdot}34 + 3{\cdot}44 + 4 + 0{\cdot}33$

434·43
43·34
3·44
4·00
0·33
485·54

8. (*c*) $1453{\cdot}9919 + 2364{\cdot}0081 + 9712{\cdot}4328 + 3018{\cdot}6029$

$1454 + 2364 + 9712 + 3019$

$= 16549$

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Multiplication and Division

Each and every concept of vedic mathematics is clearly defined in the Quantitive Aptitude Book. It is self explained and requires no solution.

Students can follow the rules and apply shortcut methods in simplification and important facts should be grasped.