Number of Zeroes. Test :- 02.

(1) Find the digit in the thousands position of $5^5 \times 2^{101}$.

→ $\boxed{0}$ — Ans. → By unit digit concept. $\boxed{C}$

(2) $\frac{13}{143} + \frac{13}{99} + \frac{13}{63} + \frac{13}{35} + \frac{13}{15} + \frac{13}{3} = ?$

→ $\frac{13}{3} + \frac{13}{15} + \frac{13}{35} + \frac{13}{63} + \frac{13}{99} + \frac{13}{143}$.

$= \frac{13}{1\times 3} + \frac{13}{3\times 5} + \frac{13}{5\times 7} + \frac{13}{7\times 9} + \frac{13}{9\times 11} + \frac{13}{11\times 13}$

2 diff. 2 diff. 2 2 2 2

$\frac{13}{2}\left(1 - \frac{1}{13}\right)$

$= \frac{\cancel{13}}{\cancel{2}} \times \frac{\cancel{12}\,6}{\cancel{13}}$

$\boxed{= 6}$ — Ans. $\boxed{D}$

(3) Find the least multiple of 100 which is also a perfect square.

→ 100 is also a multiple of 100.

And it is the least multiple of 100 which is also a perfect square.

So, $\boxed{100}$ — Ans. $\boxed{A}$

(4) If $\dfrac{1}{a + \dfrac{1}{b + \dfrac{1}{c + \dfrac{1}{3}}}} = \dfrac{51}{118}$ then

$a + b + c = ?$

→ $\frac{118}{51} = 2\frac{16}{51}$, → value of a.

$= \frac{51}{16} = 3\frac{3}{16}$. → value of b.

$= \frac{16}{3} = 5\frac{1}{3}$. → value of c.

So,

$a + b + c = 2 + 3 + 5$

$= \boxed{10}$ — Ans $\boxed{A}$

(5) If $\sqrt{15} = 3.87$ then find the value of $\sqrt{\frac{3}{5}} + 6\sqrt{\frac{5}{3}}$.

→ we may write it as

$\frac{\sqrt{3}}{\sqrt{5}} + \frac{6\sqrt{5}}{\sqrt{3}}$

→ $\frac{3 + 6(5)}{\sqrt{15}} = \frac{33}{3.87} = \boxed{8.527}$ Ans.

$\boxed{B}$

(6) If 3317*6 is a Perfect Square, then the digit at * is :-

→ As we know that, if a number (Perfect Square) ends with 6 then Tens Place digit of that number should be odd.

So,

3317*6 — 3. (if we put here 3 then their digit sum will be '5' which can't be digit sum of a perfect square number.

So, 3317*6 — 7 (if we put here 7, then their digit sum will be '9' which can be a digit sum of a Perfect Square number.

Hence, $\boxed{7}$ (Ans) will be that digit which replace *. $\boxed{D}$

(7) The smallest number that must be subtracted from 1500 to make the resulting number a Perfect Square is.

→ $\boxed{56}$ (Ans) is that smallest number which must be subtracted from 1500 to make the resulting number a perfect sq.

So, $1500 - \boxed{56} = 1444$ i.e, $(38)^2$. $\boxed{C}$

Ans

(8) Simplify :- $\dfrac{\frac{9}{51} \times \frac{17}{3} \times \left(2-\frac{1}{3}\right) \times \left(1-\frac{2}{5}\right)}{\frac{26}{25} \times \frac{5}{19} \times \left(3-\frac{3}{13}\right) \times \left(4-\frac{5}{6}\right)}$.

$$\rightarrow \frac{\cancel{\frac{9}{51}} \times \cancel{\frac{17}{3}} \times \left(2-\frac{1}{3}\right) \times \left(1-\frac{2}{5}\right)}{\cancel{\frac{26}{25}} \times \frac{5}{19} \times \left(3-\frac{3}{13}\right) \times \left(4-\frac{5}{6}\right)}$$

$$= \frac{\left(\frac{5}{3} \times \frac{3}{5}\right)}{\frac{26}{5} \times \frac{1}{19}\left(\frac{36}{13} \times \frac{19}{6}\right)}$$

$$\frac{1}{\frac{12}{5}} = \boxed{\frac{5}{12}}$$ $\boxed{A}$

(9) find the number of Zeroes in the last of the product of 5×10×15×20×25×.....×1500.

→ 5×10×15×20×25×.....×1500.

= 5(1×2×3×4×....×300).

To find the number of Zeroes we should have a Pair of (2,5).

As we know that to find the no. of Zeroes we always Count less number of (2 & 5).

ATQ

As, it has less no. of 5.

So, from the given expression.

Soln:- 300 (To find the no. of '5' we keep dividing by '2' until 1.)
↓
150
75
37
18
9 (after getting '1' we add all of them.)
4
2
1
+
$\boxed{296}$ → Ans $\boxed{B}$

Note:-

→ If we have to find no. of 2. Then, we keep multiplying by '2'. we write all the value other than unit digit until single digit. And after that we add all the ~~unit~~ numbers.

(10) $\sqrt{\sqrt{1024}+\sqrt{7921}} \times 11 = ?$

→ $\cancel{\sqrt{\sqrt{32}+}}$

$= \sqrt{32+89} \times 11$

$= \sqrt{121} \times 11$

$= 11 \times 11$

$= \boxed{121}$ — Ans. $\boxed{B}$

(11) The right most non-zero digit of the number 30^{2928} ?

→ 30^{2928}. $\Rightarrow \frac{2928}{4} = 732$

Here, Power is multiple of 4.

So, $30^4 = 30 \times 30 \times 30 \times 30$

$= 810000$

↓

The right most non-zero digit is '1' — Ans. $\boxed{A}$

(12) If $x>1$ then which of the following is true.

→ $x > 1$.

→ $\boxed{\sqrt{x} < x < x^2}$ — Ans $\boxed{C}$

(13) If $\sqrt{4096} = 64$, then the value of $\sqrt{40.96} + \sqrt{0.4096} + \sqrt{0.004096} + \sqrt{0.00004096}$.

→ $\sqrt{40.96} \longrightarrow 6.4$

$\sqrt{0.4096} \longrightarrow 0.64$.

$\sqrt{0.004096} \longrightarrow 0.064$.

$\sqrt{0.00004096} \longrightarrow 0.0064$

So,
$$\begin{array}{r} 6.4 \\ 0.64 \\ +\ 0.064 \\ \hline \cancel{7.1044} \\ \hline 7.1040 \\ -\ 0.0064 \\ \hline 7.0976 \end{array}$$
— Ans. $\boxed{A}$

(14) The digit in units Place of the Product $49237 \times 3995 \times 738 \times 83 \times 9$ is :–

→ $399(5) \times 4923(7) \times 73(8) \times 8(3) \times (9)$

$= 5 \times 7 \times 8 \times 3 \times 9$ (unit digit.)

$= \boxed{0}$ — A $\boxed{A}$

(15) Unit digit of the number $(22)^{23}$ is :–

→ $(22)^{23}$ → if Power will divided by 4 then we get remainder will 3.

So, $(22)^3$.

i.e, $(2)^3$ → (unit digit).

So, $\boxed{8}$ is unit digit.

Ans $\boxed{B}$

(16) The least Positive integer, when multiplied by 200, the Product is a perfect Square is:–

→ '2', is that least Positive integer, when multiplied by 200, the product is $(2 \times 200 = 400)$ is a Perfect Sq. number.

So, $\boxed{2}$ is Answer. $\boxed{B}$

(17) The simplified value of

$7\frac{1}{2} - \left[2\frac{1}{4} \div \left\{1\frac{1}{4} - \frac{1}{2}\left(1\frac{1}{2} + \frac{1}{3} + \frac{1}{6}\right)\right\}\right]$.

→ $\frac{15}{2} - \left[\frac{9}{4} \div \left\{\frac{5}{4} - \frac{1}{2}\left(\frac{3}{2} + \frac{1}{3} + \frac{1}{6}\right)\right\}\right]$.

$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{\frac{5}{4} - \frac{1}{\cancel{2}} \times \cancel{2}\right\}\right]$.

$= \frac{15}{2} - \left[\frac{9}{4} \div \left\{\frac{5}{4} - \frac{1}{1}\right\}\right]$.

$= \frac{15}{2} - \left[\frac{9}{\cancel{4}} \times \cancel{4}\right]$.

$= \frac{15}{2} - \frac{9}{1}$ $\boxed{D}$

$= \frac{15-18}{2} = \boxed{\frac{-3}{2}}$ — Ans.

(18) $\frac{9}{3 \times 7} + \frac{9}{7 \times 11} + \frac{9}{11 \times 15} + \frac{9}{15 \times 19}$ ---- $+ \frac{9}{23 \times 27}$

→ $\frac{9}{\underbrace{3 \times 7}_{\text{diff.}=4}} + \frac{9}{\underbrace{7 \times 11}_{4}} + \frac{9}{\underbrace{11 \times 15}_{4}} + \frac{9}{\underbrace{15 \times 19}_{4}}$ ---- $+ \frac{9}{\underbrace{23 \times 27}_{4}}$

$\frac{9}{4}\left(\frac{1}{3\times7}+\frac{1}{7\times11}+\frac{1}{11\times15}+\frac{1}{15\times19}+\cdots\frac{1}{23\times27}\right)$

$= \frac{9}{4}\times\left(\frac{1}{3}-\frac{1}{27}\right)$

$= \frac{\cancel{9}}{\cancel{4}}\times\frac{\cancel{24}\,\cancel{8}\,2}{\cancel{27}\,3} = \boxed{\frac{2}{3}}$ — Ans $\boxed{C}$

(19) Express the decimal as a fraction of $0.07\overline{07}$:-

→ $0.07\overline{07}$

$= \frac{707-7}{9900} = \frac{7\cancel{00}}{99\cancel{00}}$

$\boxed{=\frac{7}{99}}$ A $\boxed{A}$

(20) find the unit's place digit of $(312)^{187}\times(614)^{153}\times(915)^{189}$.

→ $(31\underset{\downarrow}{2})^{187}\times(61\underset{\downarrow}{4})^{153}\times(91\underset{\downarrow}{5})^{189}$.

unit digit   unit digit   unit digit.

$=(2)^{187}\times(4)^{153}\times(5)^{189}$

$=\boxed{0}$ — A $\boxed{A}$

(21) a, b and c are three single digit numbers such that 0. abcabcabc ---- = $\frac{17}{27}$, find the value of a+b+c = ?.

→ $0.abcabcabc = \frac{17}{27}$.

$0.\overline{abc} = \frac{17}{27}$

$= \frac{abc}{\cancel{999}\,\cancel{111}\,37} = \frac{17}{\cancel{27}\,3}$

abc = 629

a+b+c = 6+2+9

$=\boxed{17}$ — A $\boxed{D}$

(22) $\left[\left(1-\frac{1}{2^2}\right)\left(1-\frac{1}{3^2}\right)\left(1-\frac{1}{4^2}\right)\left(1-\frac{1}{5^2}\right)----\left(1-\frac{1}{19^2}\right)\right]^{-1} = ?.$

→ $\left[\left(1-\frac{1}{4}\right)\left(1-\frac{1}{9}\right)\left(1-\frac{1}{16}\right)\left(1-\frac{1}{25}\right)----\left(1-\frac{1}{361}\right)\right]^{-1}$.

$=\left[\frac{3}{4}\times\frac{\cancel{8}}{\cancel{9}\,3}\times\frac{\cancel{15}\,5}{\cancel{16}\,2}\times\frac{\cancel{24}\,2}{\cancel{25}\,5}--\times\frac{\cancel{360}\,90}{\cancel{361}\,19}\right]^{-1}$.

$=\left(\frac{1}{\cancel{9}}\times\frac{\cancel{90}\,10}{19}\right)^{-1}$.

$=\left[\frac{10}{19}\right]^{-1} = \boxed{\frac{19}{10}}$ — Ans

Or.

$\left[\left(1-\frac{1}{2}\right)\left(1+\frac{1}{19}\right)\right]^{-1}$.

$=\left[\frac{1}{\cancel{2}}\times\frac{\cancel{20}\,10}{19}\right]^{-1}$.

$=\left[\frac{10}{19}\right]^{-1} = \boxed{\frac{19}{10}}$ — A $\boxed{B.}$

(23) find the number divisible by 3 or 4 till 1000.

→ ~~1000~~ L.C.M of 3 & 4 is 12.

so,

$$\frac{1000}{3}+\frac{1000}{4}-\frac{1000}{12}$$

$= 333+250-83$

$= 500$ .. ~~A~~ $\boxed{A}$.

(24). find the unit digit in the Product of $(4387)^{295}\times(621)^{72}$.

$\rightarrow (4387)^{295}\times(621)^{72}$

$= (438\underset{\text{unit digit}}{\underset{\downarrow}{7}})^{295}\times(62\underset{\text{unit digit}}{\underset{\downarrow}{1}})^{72}$

$(7)^1\times(1)^1$

$= \boxed{7.}$ ~~A~~ $\boxed{D}$

(25). find the value of $x+y+z$, if x, y, z is an integer:-

$$1+\cfrac{3}{4}{1+\cfrac{1}{2+\cfrac{2}{1+5}}} = x\frac{y}{z}.$$

$\rightarrow$ solve from bottom.

$1+\frac{2}{5}=\frac{7}{5} \Rightarrow 2+\frac{5}{7}=\frac{19}{7}.$

$\Rightarrow 1+\frac{4\times7}{19}=1+\frac{28}{19}=\frac{19+28}{19}$

$=\frac{47}{19} \Rightarrow 1+\frac{3\times19}{47}=\frac{47+57}{47}$

$=\frac{104}{47}=2\frac{10}{47}=x+y+z$
$=2+10+47$

$\boxed{B}$ $\boxed{=59}$ — Ans