Solutions:

S1. Ans.(d)
Sol. LCM of 7, 14 and 21 = 42

```
42 ) 9999 ( 238
      84
      159
      126
       339
       336
         3
```

So, required number = 9999 – 3 = 9996

S2. Ans (a)
Sol. last digit of each number is 3
So 3 is added 100 times
Last digitof 3 × 100 =0

S3. Ans (d)
Sol. LCM of 8, 12, 15, 20 → 120

```
           8
120)99999
    960
     39
```

No. is = 99999 – 39 = 99960

S4. Ans (b)
Sol. to be divisible by 72, the number also should be divisible by 8 and 9.
$8 \to 49x$

$x = 6$

Now
$9 \to 4523y17496$
y = 4
Req. value $\Rightarrow 30 - 16 = 14$

S5. Ans.(a)
Sol.

calculation done by student $= \dfrac{x+12}{6} = 112$

$x = 660$

Correct are $= \dfrac{660}{6} + 12 = 122$

S6. Ans. (b);
Sol.

Req. height of 3rd bounce $= 32.\left(\dfrac{3}{4}\right)^3 = 32.\dfrac{27}{64} = 13\dfrac{1}{2}$ m.

S7. Ans. (b)
Sol.

$\dfrac{\left[(1931)^{odd}\right]^{even}}{1932}$, Remainder $= 1$

$\left[\dfrac{(a-1)^{even}}{a}; R = 1\right]$

S8. Ans.(b)
Sol. To be Divisible by 8

$37y \Rightarrow y = 6$

To be divisible by 9 $\Rightarrow \dfrac{2+6+2+2+x+1+2+3+7+6}{9}$

$\dfrac{31+x}{9} \Rightarrow x = 5$

$2x - y = 10 - 6 = 4$

S9. Ans.(a)
$n = 14q+2$
$3n = 3 \times 14q + 6$
Remainder is 6

S10. Ans.(d)
Sol. Unit digit of given function is zero, because there are (2×5).

S11. Ans.(b)
Sol. $x^2 - 4x + a = 0$
　　　Check by option
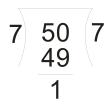　　　Put a = 4
　　　$(x-2)^2 = x^2 - 4x + 4 = 0$
　　　So a = 4

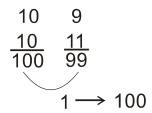S12. Ans.(d)

Sol.

$$\frac{n-3}{7} = 1$$

n-3 = 7
n = 10
5x = 50

```
7 ) 50 ( 7
     49
     ‾‾
      1
```

S13. Ans.(c)

Sol. $10\% = \frac{1}{10}$

```
 10     9
 10    11
‾‾‾   ‾‾
100    99
```

1 ⟶ 100

100×100 = 10000

S14. Ans.(a)
Sol.
106974 is divisible by 2, 3, 6, and 7 only.

S15. Ans.(a)
Sol. Face value of the digit 6 in 16008 is 6.
 place value of 6 in 16008 is 6000.

S16. Ans.(c)
  L.C.M of 5, 6, 7 = 210
diff. (5 - 1) - (6 - 2) = (7 - 3) = 4
then,   when largest four-digit number is 9999 divided by 210 gives remainder = 129
⟹ 9999 - 129 - 4 = 9866
required answer = 9 × 8 × 6 × 6 = 2592

S17. Ans.(a)
Sol. $5k(k$ - 1), here k and $(k - 1)$ are two consecutive digits and out of them one will always be divisible by 2.
So, option (a) is correct.

S18. Ans.(a)
Sol.
L.C.M of 3, 7, and 11 = 231
The 5 digits, give number (133xy) is completely in divisible by 231.
Let the 5 digits give no. be 13399.
When 13399 ÷ 231 = 1 Remainder.
The 5 digits no. completely divisible = 13399 – 1 = 13398
Then,   x = 9 and y = 8
So,   5x + 8y = 5 × 9 + 8 × 8 = 109

S19. Ans.(d)
Sol. Given 1981pq divisible
by 9, 11 and 13
By Option elimination method.
$\Rightarrow$ p= 9 and q = 8
$\Rightarrow$ 1981 9 8 is divisible by 9, 11 and 13

S20. Ans.(a)
Sol.
    320682 is divisible by 3 Not divisible by 9.