RRB NTPC Number System Questions with Solutions

Q1.

Question: The greatest number of four digits which is exactly divisible by 7, 14 and 21 is—
Answer: (d) 9996
Explanation: LCM of 7, 14, and 21 = 42. Greatest 4-digit number = 9999.
9999 ÷ 42 = 238.07 → 238 × 42 = **9996**

Q2.

Question: Find the last digit of the expression $1^3 + 2^3 + 3^3 + \ldots + 100^3$.
Answer: (b) 6
Explanation: The sum of cubes of first n natural numbers = $(n(n+1)/2)(n(n + 1)/2)^2$.
So for n = 100: $(100\times101/2)(100\times101/2)^2 = (5050)^2$ → Ends with **6**

Q3.

Question: The greatest 5-digit number divisible by 8, 12, 15, and 20 is—
Answer: (d) 99960
Explanation: LCM of 8, 12, 15, 20 = 120.
99999 ÷ 120 = 833.325 → 833 × 120 = **99960**

Q4.

Question: If 4523y1749x is divisible by 72, find (5x - 4y)
Answer: (c) 15
Explanation: For divisibility by 72: Number must be divisible by 8 & 9.
Last 3 digits x49 must be divisible by 8 ⇒ x = 6
Sum of digits = 45 ⇒ y = 3
(5×6 - 4×3) = 30 - 12 = **18**

Q5.

Answer: (a) 122
Explanation:
Let number = x

Incorrect: (x + 12)/6 = 112 → x + 12 = 672 → x = 660
Correct: x/6 + 12 = 660/6 + 12 = 110 + 12 = **122**

Q6.

Answer: (b) 13.5 m
Explanation:
Each bounce reaches ¾ of previous height:
1st bounce: 32 × ¾ = 24
2nd: 24 × ¾ = 18
3rd: 18 × ¾ = **13.5 m**

Q7.

Answer: (b) 1
Explanation: a^k mod (a+1) = 1 when a and a+1 are coprime.
(1931)^anything mod 1932 = **1**

Q8.

Answer: (a) 2
Explanation: Use divisibility by 8 & 9.
Last 3 digits 3x7 must be divisible by 8 → x = 4
Sum of digits = divisible by 9 → y = 3
2x - y = 8 - 6 = **2**

Q9.

Answer: (a) 6
Explanation: n ≡ 2 (mod 14) → 3n ≡ 6 (mod 14)
6 mod 7 = **6**

Q10.

Answer: (d) 0
Explanation:
From 113 to 123, one number (ending in 5 or 0) will contribute 0 at unit digit.
Full product has multiple of 10 → unit digit = **0**

Q11.

Answer: (b) 4
Explanation:
Equal roots → D = 0 ⇒ $b^2 - 4ac = 0 \Rightarrow 16 - 4a = 0 \Rightarrow a = \mathbf{4}$

Q12.

Answer: (c) 2
Explanation:
$n \equiv 3 \bmod 7 \rightarrow 5n \equiv 15 \equiv \mathbf{1} \bmod 7$

Q13.

Answer: (c) 10000
Explanation:
Let x be original number
After 10% decrease and 10% increase:
$x \times 0.9 \times 1.1 = 0.99x \rightarrow 0.99x = x - 100 \rightarrow x = \mathbf{10000}$

Q14.

Answer: (a) 2, 3, 6 and 7 only
Explanation:
Check divisibility: Even → 2, sum = 27 → 3, ends in 4 → not 5 or 10, $74 \% 4 \neq 0$ → not 4

Q15.

Answer: (a) 6
Explanation: Face value is the digit itself, place value is different. → **6**

Q16.

Answer: (c) 2592
Explanation:
Find number satisfying A % 5 = 1, A % 6 = 2, A % 7 = 3
Use Chinese Remainder or options → A = 9996 → 9+9+9+6 = 33, product = **2592**

Q17.

Answer: (a) 5 and 10
Explanation:
$5k^2 - 5k = 5k(k - 1)$, two consecutive numbers → one is even ⇒ divisible by **10**

Q18.

Answer: (d) 162
Explanation:
Divisible by 3, 7, 11 ⇒ LCM = 231
Try options → x = 6, y = 9 satisfies
5x + 8x = 13x = 13×12 = **162**

Q19.

Answer: (b) p = 8, q = 0
Explanation:
Check which combo makes number divisible by 9, 11, and 13 ⇒ LCM = 1287
Try 198180 divisible by 1287 ⇒ Yes

Q20.

Answer: (a) 320682
Explanation:
Check divisibility by 3 (sum divisible by 3) but not by 9 (sum not divisible by 9)
Only 320682 meets both conditions

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