

PRACTICE EXERCISES

MULTIPLE CHOICE QUESTIONS (MCQs)

Each of the following questions has four choices (a), (b), (c) and (d) out of which only one choice is correct. Mark the correct choice.

- The least positive integer x satisfying $28 \equiv x \pmod{6}$ is
(a) 2 (b) 4 (c) 3 (d) 1
- If x is the least non-negative integer satisfying $218 \equiv x \pmod{7}$, then $x^2 + 1$ is equal to
(a) 1 (b) 2 (c) 5 (d) 50
- The unit's digit of 7^{100} is
(a) 1 (b) 7 (c) 2 (d) 4
- The smallest non-negative integer congruent to $2796 \pmod{7}$ is
(a) 1 (b) 2 (c) 5 (d) 3
- The least non-negative remainder when 3^{242} is divided by 13 is
(a) 3 (b) 6 (c) 9 (d) 1
- The remainder when 2^{100} is divided by 5 is
(a) 1 (b) 2 (c) 3 (d) 4
- The remainder when 5^{61} is divided by 7 is
(a) 1 (b) 2 (c) 4 (d) 5
- The unit digits in 11^{24} is
(a) 7 (b) 8 (c) 9 (d) 1
- The units digit in 6^{600} is
(a) 2 (b) 4 (c) 6 (d) 8
- The units digit in 3^{300} is
(a) 1 (b) 2 (c) 3 (d) 6
- The value of x in the set $\{0, 1, 2, \dots, 10\}$ satisfying $3 - x \equiv 5 \pmod{11}$ is
(a) 10 (b) 9 (c) 8 (d) 2
- The value of x in the set $\{0, 1, 2, \dots, 6\}$ such that $53814 \equiv x$ is
(a) 2 (b) 4 (c) 5 (d) 3
- The value of $5 \times {}_8P_{11}$ is
(a) -1 (b) 0 (c) 7 (d) 9
- If $x \equiv -4 \pmod{3}$, then a solution for x is
(a) -2 (b) 12 (c) 19 (d) 35
- If the present time is 8 : 40 PM, then the time after $876\frac{1}{2}$ hours will be :
(a) 8 : 40 AM (b) 9 : 10 AM (c) 6 : 10 PM (d) 10 : 40 PM

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16. If $100 \equiv x \pmod{7}$, then the least positive value of x is

- (a) 6 (b) 4 (c) 3 (d) 2 [CBSE 2023]

ASSERTION-REASON BASED MCQs

Each of the following examples contains STATEMENT-1 (Assertion) and STATEMENT-2 (Reason) has following four choices (a), (b), (c) and (d), only one of which is the correct answer. Mark the correct answer.

- (a) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1.
 (b) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
 (c) Statement-1 is true, Statement-2 is false.
 (d) Statement-1 is false, Statement-2 is true.

17. Statement – 1 (A): $24 \equiv -4 \pmod{6}$

Statement – 2 (R): $a \equiv b \pmod{m}$ iff $a-b$ is an integral multiple of m .

18. Statement – 1 (A): The least non-negative value of x satisfying $x \equiv 7 \pmod{5}$ is 2.

Statement – 2 (R): $a \equiv b \pmod{m}$ iff m divides $(a-b)$.

19. Statement – 1 (A): $(a+b) \bmod m = (a \bmod m + b \bmod m) \bmod m$

Statement – 2 (R): $a + {}_m b = \begin{cases} a+b, & \text{if } a+b < m \\ \text{Remainder when } a+b \text{ is divided by } m. \end{cases}$

20. Statement – 1 (A): $12 - {}_{14}21 = 5$

Statement – 2 (R): $a - {}_m b = \begin{cases} a-b, & \text{if } a-b < m \\ (a-b) \bmod m, & \text{if } a-b \geq m \end{cases}$

21. Statement – 1 (A): The units digit of 3^{50} is 9.

Statement – 2 (R): The units digit of a^b is the non-negative integer r such that $a^b \equiv r \pmod{10}$, where $0 \leq r < 10$.

ANSWERS

1. (b) 2. (b) 3. (a) 4. (d) 5. (c) 6. (a) 7. (d) 8. (d) 9. (c)
 10. (a) 11. (b) 12. (c) 13. (c) 14. (d) 15. (b) 16. (d) 17. (d) 18. (a)
 19. (b) 20. (a) 21. (a)