10. M. 2.NUMBERS AND SEQUENCE

1. Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that $a = bq + r$, where r must satisfy.
   (A) $1 < r < b$ (B) $0 < r < b$ (C) $0 \leq r < b$ (D) $0 < r \leq b$
2. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
   (A) 0, 1, 8 (B) 1, 4, 8 (C) 0, 1, 3 (D) 1, 3, 5
3. If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is
   (A) 4 (B) 2 (C) 1 (D) 3
4. The sum of the exponents of the prime factors in the prime factorization of 1729 is
   (A) 1 (B) 2 (C) 3 (D) 4
5. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
   (A) 2025 (B) 5220 (C) 5025 (D) 2520
6. $7^{4k} \equiv$ ____ (mod 100)
   (A) 1 (B) 2 (C) 3 (D) 4
7. Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_5 is
   (A)3 (B)5 (C)8 (D)11
8. The first term of an arithmetic progression is unity and the common difference is 4. Which of the following will be a term of this A.P.
   (A) 4551 (B) 10091 (C) 7881 (D) 13531
9. If 6 times of 6th term of an A.P. is equal to 7 times the 7th term, then the 13th term of the A.P. is
   (A) 0 (B) 6 (C) 7 (D) 13
10. An A.P. consists of 31 terms. If its 16th term is m, then the sum of all the terms of this A.P. is
    (A) 16 m (B) 62 m (C) 31 m (D) 31/2m
11. In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120?
    (A) 6 (B) 7 (C) 8 (D) 9
12. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \; + 2^{0}$ which of the following is true?
    (A) B is 2_{64} more than A (B) A and B are equal
    (C) B is larger than A by 1 (D) A is larger than B by 1
13. The next term of the sequence 3/16, 1/8, 1/12, 1/18,......is
    (A) 1/24 (B) 1/27 (C) 2/3 (D) 1/81
14. If the sequence $t_1\ t_2\ t_3$,... are in A.P. then the sequence t_6, t_{12}, t_{18},... is
    (A) a Geometric Progression (B) an Arithmetic Progression
    (C) neither an Arithmetic Progression nor a Geometric Progression
    (D) a constant sequence
15. The value of $(1^3 + 2^3 + 3^3 + \cdot + 15^3) - (1 + 2 + 3 = ... + 15)$ is
    (A) 14400 (B) 14200 (C) 14280 (D) 14520