

NAME :

CLASS & SEC. :

# 2

## NUMBERS AND SEQUENCES

*"I know numbers are beautiful, if they aren't beautiful, nothing is"*  
- Paul Erdos

- 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)  $0 < r \leq b$
- 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
- 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
- The sum of the exponents of the prime factors in the prime factorization of 1729 is  
(A) 1 (B) 2 (C) 3 (D) 4
- 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
- $7^{4k} \equiv \underline{\hspace{1cm}} \pmod{100}$   
(A) 1 (B) 2 (C) 3 (D) 4
- Given  $F_1 = 1$ ,  $F_2 = 3$  and  $F_n = F_{n-1} + F_{n-2}$  then  $F_8$  is  
(A) 3 (B) 5 (C) 8 (D) 11
- 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
- If 6 times of 6<sup>th</sup> term of an A.P. is equal to 7 times the 7<sup>th</sup> term, then the 13<sup>th</sup> term of the A.P. is  
(A) 0 (B) 6 (C) 7 (D) 13
- An A.P. consists of 31 terms. If its 16<sup>th</sup> 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)  $\frac{31}{2} m$
- 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
- If  $A = 2^{65}$  and  $B = 2^{64} + 2^{63} + 2^{62} + \dots + 2^0$  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
- The next term of the sequence  $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$  is  
(A)  $\frac{1}{24}$  (B)  $\frac{1}{27}$  (C)  $\frac{2}{3}$  (D)  $\frac{1}{81}$
- If the sequence  $t_1, t_2, t_3, \dots$  are in A.P. then the sequence  $t_6, t_{12}, t_{18}, \dots$  is  
(A) a Geometric Progression (B) an Arithmetic Progression  
(C) neither an Arithmetic Progression nor a Geometric Progression  
(D) a constant sequence
- The value of  $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$  is  
(A) 14400 (B) 14200 (C) 14280 (D) 14520

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