

**VINAYAGA TUITION CENTRE ANAIMALAI**  
**UNIT TEST (NUMBERS AND SEQUENCES)**  
**MATHEMATICS**

**CLASS: 10****TIME: 1.30Hrs****MARKS: 50****I. Choose the best answer****10x1=10**

1. Euclid's division lemma states that for positive integer a and b there exists unique integer q and r such that  $a=bq+r$  where must be satisfy  
 a)  $1 < r < b$       b)  $0 < r < b$       c)  $0 \leq r < b$       d)  $0 < r \leq b$
2. If the HCF of 65 and 117 is expressible in the form  $65m - 117$  then the value of m is  
 a) 4      b) 2      c) 1      d) 3
3. the sum of the exponent of the prime factors in the prime factorization of 1729 is  
 a) 1      b) 2      c) 3      d) 4
4.  $7^{4k} \equiv \underline{\hspace{2cm}} \pmod{100}$       a) 1      b) 2      c) 3      d) 4
5. 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
6. If 6 times of 6<sup>th</sup> term of an A.P is equal to 7 times of 7<sup>th</sup> term then the 13<sup>th</sup> term of an A.P is  
 a) 0      b) 6      c) 7      d) 13
7. An A.P consists of 31 terms If its 16<sup>th</sup> terms is m then the sum of all the terms of this A.P is  
 a) 16m      b) 62m      c) 31m      d)  $\frac{31}{2} m$
8. In an A.P., the first term is 1 and the common difference is 4 how many terms of the A.P must be term for their sum to be equal to 120  
 a) 6      b) 7      c) 8      d) 9
9. The next term of the sequence  $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$   
 a)  $\frac{1}{24}$       b)  $\frac{1}{27}$       c)  $\frac{2}{3}$       d)  $\frac{1}{81}$
10. 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

**II. Answer the following any 10 questions****10 x 2 = 20**

11. Show that the square of an odd integer is of the form  $4q + 1$ , for some integer q.
12. Find all positive integers, when divided by 3 leaves remainder 2.
13. 'a' and 'b' are two positive integers such that  $a^b \times b^a = 800$ . Find 'a' and 'b'.
14. Determine the value of d such that  $15 \equiv 3 \pmod{d}$ .
15. Solve  $3x - 2 = 0 \pmod{11}$ .
16. If  $a_1 = 1, a_2 = 1$  and  $a_n = 2a_{n-1} + a_{n-2}, n \geq 3, n \in \mathbb{N}$ , then find the first six terms of the sequence.
17. Find the number of terms in the A.P. 3, 6, 9, 12, ....., 111
18. Which term of an A.P. 16, 11, 6, 1, ... is -54?
19. Find the sum of first 28 terms of an A.P. whose n<sup>th</sup> term is  $4n - 3$ .
20. Find the 8<sup>th</sup> term of the G.P. 9, 3, 1, ...
21. In a G.P. 729, 243, 81, ... find  $t_7$ .

22. Find the sum  $3+1+\frac{1}{3}+\dots\infty$ .
23. If  $1+2+3+\dots+n = 666$  then find n.

**III. Answer the following any 4 question**

**4 x 5= 20**

24. Find the HCF of 396, 504, 636.
25. If  $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$  where  $p_1, p_2, p_3, p_4$  are primers in ascending order and  $x_1, x_2, x_3, x_4$  are integers, find the value of  $p_1, p_2, p_3, p_4$  and  $x_1, x_2, x_3, x_4$ .
26. A mother divides Rs. 207 into three parts such that the amount is in A.P. and gives it to her three children. The product of the two least amounts that the children had Rs. 4623. Find the amount received by each child.
27. If  $S_1, S_2, S_3, \dots, S_m$  are the sums of n terms of m A.P.'s whose first terms are 1, 2, 3, ..., m and whose common differences are 1, 3, 5, ...,  $(2m - 1)$  respectively, then show that  $S_1 + S_2 + S_3 + \dots + S_m = \frac{1}{2} mn (mn + 1)$ .
28. The present value of a machine is Rs. 40,000 and its value depreciates each year by 10%. Find the estimated value of the machine in the 6<sup>th</sup> year.
29. Find the sum to n terms of the series  $3 + 33 + 333 + \dots$  to n terms.
30. Rekha has 15 square colour papers of sizes 10 cm, 12cm, ..., 24 cm. How much area can be decorated with these colour papers ?

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