

**DELHI PUBLIC SCHOOL, JAMMU**

**SESSION: 2021-22**

**ASSIGNMENT**

**Class : XI**  
**Month : July**

**Subject: Mathematics**

**Sequence and Series/Complex numbers**

1. Which of the following is correct?  
a)  $3+i < 1-i$     b)  $1+i > i$     c)  $4i+3 > i+2$     d) None of these
2. The value of  $1+i^2+i^4+i^6+\dots+i^{2n}$  is  
a) Positive    b) Negative    c) Zero    d) Cannot be determine
3. The number which should be added to the numbers 2,14 and 62 so that the resulting numbers may be in G.P is  
a) 4    b) 2    c) 5    d) 1
4. How many terms of the series  $2+6+18+\dots$  must be taken to make the sum equal to 728?  
a) 18    b) 9    c) 4    d) 6
5. If  $\{(1+i)/(1-i)\}^n = 1$  then the least value of n is  
(a) 1    (b) 2    (c) 3    (d) 4
6. If the third term of an A.P. is 7 and its 7 th term is 2 more than three times of its third term, then the sum of its first 20 terms is  
(a) 228    (b) 74    (c) 740    (d) 1090
7. If  $x + iy = \frac{a+ib}{a-ib}$ , prove that  $x^2 + y^2 = 1$ .
8. Find the real values of x and y if  $(x+iy)(2-3i) = 4+i$ .
9. Find the conjugate of  $(1+i)^2$ .
10. Find the real values of x and y for which the complex numbers  $-3+ix^2y$  and  $x^2+y+4i$  are conjugate of each other.
11. Find real  $\theta$  such that  $\frac{3+2i \sin \theta}{1-2i \sin \theta}$  is purely real.
12. The ratio of the sums of m and n terms of an A.P is  $m^2:n^2$ . Show that the ratio of the  $m^{\text{th}}$  and  $n^{\text{th}}$  terms is  $(2m-1): 2n-1$ .
13. If  $a(1/b+1/c)$ ,  $b(1/c+1/a)$ ,  $c(1/a+1/b)$  are in A.P, prove that a,b,c are in A.P.
14. If the coefficients of  $a^{r-1}, a^r, a^{r+1}$  in the binomial expansion of  $(1+a)^n$  are in A.P, prove that  $n^2 - n(4r+1) + 4r^2 - 2 = 0$ .
15. If a and b are the roots of  $x^2 - 3x + p = 0$  and c, d are the roots of  $x^2 - 12x + q = 0$ , where a, b, c and d forms a G.P. Prove that  $(q+p):(q-p) = 17:15$