2020-January Session-07-01-2020-shift-1

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1) $\lim_{x\to 2} \frac{3^x+\frac{27}{3^x}-12}{\frac{1}{3^{\frac{x}{2}}}-\frac{3}{3^x}}$ is equal to.

2) If variance of first n natural numbers is 10 and variance of first m even natural numbers is 16, $m+n$ is equal to

3) If the sum of the coefficients of all even powers of x in the product

$$\left(1+x+x^2+x^3\cdots+x^{2n}\right)\left(1-x+x^2-x^3\cdots+x^{2n}\right)$$

is 61, then n is equal to

4) Let S be the set of points where the function, $f(x)=|2-|x-3||$, $x\in R$, is not differentiable. Then, the value of $\sum x\in S\, f(f(x))$ is equal to

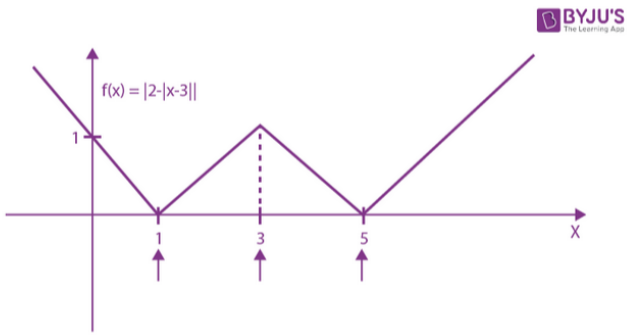

Fig. 4.

5) Let $A(1,0)$, $B(6,2)$, $C\left(\frac{3}{2},6\right)$ be the vertices of a triangle ABC. If P is a point inside the triangle ABC such that the triangle APC, APB and BPC have equal areas, then the length of the line segment PQ, where Q is the point $\left(\frac{-7}{6},\frac{-1}{3}\right)$, is