SUCCESS KEY TEST SERIES

Work Sheet

Std: 11th Science | **Subject: Mathematics & Statistics** | **Time: 1Hrs**

Date : | **4.Method of Induction and Binomial Theorem** | **Max Marks: 40**

Q.1 Select and write the most appropriate answers from given alternatives: 10

1) Expand $(2 + x)^{-3}$ up to four terms.

(a) $\left(1-\frac{3}{2}x+\frac{3}{2}x^2-\frac{5}{4}x^3\right)$

(b) $\frac{1}{8}\left(1+\frac{3}{2}x+\frac{3}{2}x^2+\frac{5}{4}x^3\right)$

(c) $\frac{1}{8}\left(1-\frac{3}{2}x+\frac{3}{2}x^2-\frac{5}{4}x^3\right)$

(d) $\frac{1}{8}\left(-1-\frac{3}{2}x-\frac{3}{2}x^2-\frac{5}{4}x^3\right)$

2) The middle term in the expansion of $(1 + x)^{2n}$ will be :

(a) $(n - 1)^{th}$ (b) n^{th} (c) $(n + 1)^{th}$ (d) $(n + 2)^{th}$

3) If $P(n) = 1 + 2 + 3 \ldots\ldots + n = n(n+1)/2$, then what will be the equation for succession.

(a) $\frac{(k+1)(k+2)}{2}$ (b) $\frac{k(k+2)}{2}$

(c) $\frac{(k+1)(k+3)}{2}$ (d) $\frac{(k-1)(k+2)}{2}$

4) Principle of Mathematical Induction consists of

(a) Foundation (b) Assumption

(c) Succession (d) All of the above

5) Find the term involving x^2 in $\left(\frac{x}{2}-\frac{4}{x}\right)^8$

(a) $-195x^2$ (b) $-112x^2$ (c) $192x^2$ (d) None

Q.2 Answer the following: 10

1) Without expanding, find the value of

$(x + 1)^4 - 4(x + 1)^3 (x - 1) + 6 (x + 1)^2 (x - 1)^2 - 4(x + 1)(x - 1)^3 + (x - 1)^4$

2) Find the middle term(s) in the expansion of

$\left(x-\frac{1}{2y}\right)^{10}$

3) State first four terms in the expansion of

$$\frac{1}{(a+b)} \; ; \; |b| < |a|$$

4) Find tenth term in the expansion of

$$\left(2x^2 + \frac{1}{x}\right)^{12}$$

5) Show that
$C_0 + C_1 + C_2 + \ldots C_8 = 256$

Q.3 Solve the following: **15**

1) Prove by method of induction

$$\log_a x^n = n \log_a x, \; x > 0, n \in N$$

2) The 3rd term of (1 + x)n is $36x^2$. Find 5th term.

3) Find the middle terms in the expansion of

$$\left(x^4 - \frac{1}{x^3}\right)^{11}$$

4) State, by writing first four terms, the expansion of the equation, where |b| < |a| : $(a - b)^{-1/4}$

5) Find the middle terms in the expansion of

$$\left(x^2 + \frac{1}{x}\right)^{7}$$

Q.4 Solve the following: (ANY ONE) **5**

1) Show that
$c_0 + c_2 + c_4 + \ldots\ldots + c_{12} = c_1 + c_3 + c_5 + \ldots\ldots + C_{11} = 2048$

2) Prove by method of induction, for all n ϵ N.
3 + 7 + 11 + …. + to n terms = n(2n +1)

-------- All the Best --------