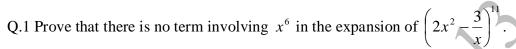


## CLASS XI MATHS

## **TOPIC-BINOMIAL THEOREM**



Q.2 Find the coefficient of  $x^5$  in the expansion of the product  $(1+2x)^5(1-x)^7$ .

Q3. If the coefficient of '4'th and '13'th terms in the expansion of  $[x^2 + (1/x)]^n$  be equal, then find the term which independent of 'x'.

Q.4 Show that the ratio of the coefficient of  $x^{10}$  in  $(1-x^2)^{10}$  and the term independent of x in  $\left(x-\frac{2}{x}\right)^{10}$  is (1:32).

Q.5 Using binomial theorem prove that  $(3^{2n+2} - 8n + 9)$  is divisible by 64, where n is a positive integer.

Q 6. Let 'n' be a positive integer. If the coefficients of second, third and fourth terms in  $(1+x)^2$  are in arithmetic progression, then find the value of 'n'.

Q 7. The  $3^{rd}$ ,  $4^{th}$  and  $5^{th}$  terms in the expansion of  $(x+a)^n$  are respectively '84', '280' and '560', find the value of 'x', 'a' and 'n'.

Q 8. Find the coefficient of  $x^{50}$  in  $(1+x)^{41} (1-x+x^2)^{40}$ .

Q .9 Find The term independent of x in the expansion of:

$$(i)\left(\sqrt{x} + \frac{1}{3x^2}\right)^{10}(ii)\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^9$$

Q 10. Find the coefficient of  $x^r$  in the expansion of  $[x + (1/x)]^n$ , if it occurs.





- If the coefficients of (2r + 1)th term and (r + 2)th term in the expansion of  $(1 + x)^{43}$  are O 11. equal, find 'r'.
- If in the expansion of  $(1+x)^m$   $(1-x)^n$ , the coefficients of 'x' and 'x<sup>2</sup>' are '3' and '6' res. Q.12 Find the value of 'm'.
- If third term in the expansion of  $(x + x^{\log x})^5$  is 10,00,000. Find the value of 'x' Q.13
- Prove that the ration of the coefficient of  $x^{10}$  in  $(1-x^2)^{10}$  and the term independent of 'x' in Q.14  $[x-(2/x)]^{10}$  is 1:32.
- Find the coefficient of 'x' in the expansion of  $(1-2x^3+x^5)[1+(1/x)]^8$ Q.15
- Show that the middle term in the expansion of  $(1+x)^{2n}$  is Q.16
  - 1. 3. 5 ----- (2n-1)/(n!) .  $2^n x^n$ , 'n' being a positive integer.
- Q.17 If P be the sum of odd terms and Q that of even terms in the expansion of  $(x+a)^n$ , Prove that

(i) 
$$(P^2 - Q^2) = (x^2 - a^2)^n$$
;

(ii) 
$$4PQ = \left[ (x+a)^{2n} - (x-a)^{2n} \right]$$
(iii) 
$$2(P^2 + Q^2) = \left[ (x+a)^{2n} - (x-a)^{2n} \right]$$

- Q18.: Show that that the term independent of 'x' in the expansion of

$$[x + (1/x)]^{2n}$$
 is  $[1.3.5. --- (2n-1) / (n!)] 2^n$ 

Q19. The 6<sup>th</sup> term in the expansion of  $[(1/x^{8/3}) + x^2 \log_{10} x]^8$  is 5600. Prove that x = 10.  $= (4n!) / [(4/3)n-r]! \times [(4/3)(2n+r)]!$ 



Q 20.: Prove that the coefficient of the term independent of 'y' in the expansion of

$$[(y+1)/(y^{2/3}-y^{1/3}+1)-(y-1)/(y-y^{1/2})]^{10}$$
 is 210.

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