**MATHEMATICS**

**PAGEMAKER10**

**Binomial**

Q1. The coefficient of x5 in the expansion of (1 + x)4 (1 + x2)5 is

(a) 30

(b) 60

(c) 40

(d) none

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q2. The value of x in the expansion if the third term in the expansion is 10,000,00

(a) 10

(b) 11

(c) 12

(d) none

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q3. If the coefficient of x in the expansion of is 270, then k is

(a) 1

(b) 2

(c) 3

(d) 4

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q4. If the coefficient of (2r+4)th and (r – 2)th term in the expansion of (1 + x)18 are equal then r is

(a) 12

(b) 10

(c) 8

(d) 6

L1Difficulty1

Qtag Mathematics

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Q5. The middle term in the expansion of (1 + x)2n is

(a)

(b)

(c)

(d)

L1Difficulty1

Qtag Mathematics

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Q6. The term independent of x in is

(a)

(b)

(c)

(d) none

L1Difficulty1

Qtag Mathematics

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Q7. The largest term in the expansion of (3 + 2x)50 where x = is

(a) 5th

(b) 51th

(c) 7th

(d) 8th

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q8. The sum of the coefficient in the expansion of (1 + x – 3x2)2163 will be

(a) 0

(b) 1

(c) –1

(d) 22163

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q9. For every natural number n, 32n+2 – 8n – 9 is divisible by

(a) 16

(b) 128

(c) 256

(d) none

L1Difficulty1

Qtag Mathematics

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Q10. The sum of the series ................ + is

(a)

(b)

(c) 0

(d)

L1Difficulty1

Qtag Mathematics

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**Solutions**

S1. Ans. (b)

Sol.

(........... ( ..........

So coefficient of x5 is

S2. Ans. (a)

Sol.

=

put

x = 10 then 103102 = 105

S3. Ans. (c)

Sol.

10 – 2r – r = 1 r = 3

10k3 = 270 k = 3

S4. Ans. (d)

Sol.

2r + 3 + r – 3 = 18

r = 6

S5. Ans. (d)

Sol.

Middle term

=

S6. Ans. (a)

Sol.

=

S7. Ans. (c)

Sol.

102 – 2r 15r

r 6

S8. Ans. (c)

Sol.

Putting x = 1 in (1 + x –3x2)2163

(1 – 3 + 1)2163 = 1

S9. Ans. (a)

Sol.

32n+2 – 8n – 9 N

putting n = 2

32 × 2 – 2 – 8 × 2 – 9

729 – 16 – 9 = 704

it is divisible by 16.

S10. Ans. (b)

Sol.

(1 + x)20 = ............

put x = – 1

O = ................... ...................

O = 2+ ................. –

= = + ................. –

**LEVEL-II**

Q1. If the magnitude of the coefficient of in the expansion of , where are positive numbers, is equal to the magnitude of the coefficient of in the expansion of , then and are connected by the relation.

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q2. If ……, then the value of and is

(a) 2, 4

(b) 2, 3

(c) 3, 6

(d) 1, 2

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q3. If then the value of

d +……….. will be

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q4. If is approximately equal to for small values of , then =

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q5. The sum of +………, will be

(a)

(b)

(c)

(d) None of these

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q6. If the coefficient of the middle term in the expansion of is and the coefficients of middle terms in the expansion of is and the coefficients of middle terms in the expansion of are and then

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q7. If the polynomial …………. the coefficient of is

(a) 5050

(b) –5050

(c) 100

(d) 99

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q8. If the coefficient of in is equal to the coefficient of in , then =

(a) 1

(b) 1/2

(c) 2

(d) 3

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q9. The first four terms in the expansion of will be when

(a)

(b)

(c)

(d) None of these

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q10. The coefficients of three successive terms in the expansion of are 165, 330 and 462 respectively, then the value of will be

(a) 11

(b) 10

(c) 12

(d) 8

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

**Solutions**

S1. Ans. (a)

Sol.

General term = 8Cr(ax2)8–r(bx)–r

8Cr(a8–r x16–3r b–r)

Coefficient of x7 = 8C3.a5.b–3…(i)

General term = 8Cr.(ax)8–r.(bx2)–r

8Cr(a8–r x8–3r b–r)

Coefficient of 8C5.a3.b–5

Comparing the coefficient

8C5a3b–5 = 8C3.a5.b–3

S2. Ans. (a)

Sol.

As given …..

…… ……

S3. Ans. (a)

Sol.

We know that, ……..

If we replace by

So option is (a).

S4. Ans. (b)

Sol.

=

= ….

Neglecting higher powers of , then

.

S5. Ans. (a)

Sol.

We have

………

If is replaced by and by , then expression becomes

…….

or …..

S6. Ans. (c)

Sol.

Since term is the middle term in the expansion of , therefore 2n+2Cn+1 .

Since and terms are middle terms in the expansion of , therefore 2n+1Cn and = 2n+1Cn+1 But 2n+1Cn + 2n+1Cn+1= 2n+2Cn+1

S7. Ans. (b)

Sol.

Number of terms = 100;

Coefficient of in

….. ……

S8. Ans. (a)

Sol.

In the expansion of , the general term is

11Cr(ax2)11–r 11Cr a11–r

For , we must have and the coefficient of 11C5.a11–5 11C5

Similarly, in the expansion of , the general term is 11Cr(–1

For we must have, and the coefficient of is 11C6 11C5

As given, 11C5 11C5

S9. Ans. (c)

Sol.

= (only four terms).

S10. Ans. (a)

Sol.

Let the coefficient of three consecutive terms i.e. in expansion of are 165, 330 and 462 respectively then, coefficient of term = nCr = 165

Coefficient of term = nCr+1 = 330 and

Coefficient of term = nCr+2 = 462

or or

and

or or

or

or

**LEVEL-III**

Q1. If the coefficient of and terms in the expansion of are equal, then =

(a) 12

(b) 10

(c) 8

(d) 6

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q2. Sum of odd terms is A and sum of even terms is B in the expansion , then

(a)

(b)

(c)

(d) None of these

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q3. In the expansion of , the sum of odd terms is and sum of even terms is , then the value of will be

(a)

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q4. The expression is a polynomial of degree

(a) 5

(b) 6

(c) 7

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q5. If the sum of the coefficients in the expansion of is and if the sum of the coefficients in the expansion of is then

(a)

(b)

(c)

(d) None of these

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q6. The sum of the coefficients in the expansion of is 4096. The greatest coefficient in the expansion is

(a) 1024

(b) 924

(c) 824

(d) 724

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q7. If the sum of the coefficients in the expansion of is equal to the sum of the coefficients in the expansion of , then =

(a) 0

(b) 1

(c) May be any real number

(d) No such value exist

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q8. ……… is equal to

(a)

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q9. The least remainder when is divided by 5 is

(a) 1

(b) 2

(c) 3

(d) 4

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q10. The value of the natural numbers such that the inequality is valid is

(a) For

(b) For

(c) For

(d) For any

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

**Solutions**

S1. Ans. (d)

Sol.

S2. Ans. (c)

Sol.

…..

But by the condition,

d……

and ……

Hence

or

S3. Ans. (b)

Sol.

…..

……

……)

As the terms are alter. and

S4. Ans. (c)

Sol.

Given expression

…]}

which is a polynomial of degree 7.

S5. Ans. (b)

Sol.

We have = sum of the coefficient in the expansion of

d [Putting

Now, sum of the coefficients in the expansion of Clearly,

S6. Ans. (b)

Sol.

By hypothesis,

Since is even, hence greatest coefficient

S7. Ans. (b)

Sol.

Accordingly,

S8. Ans. (d)

Sol.

Let ……

……..

Comparing the terms, we get

Solving,

Hence given series

S9. Ans. (d)

Sol.

17 = 2 (mod 5)

Hence required remainder = 4.

S10. Ans. (a)

Sol.

Check through options, the condition is valid for