DAV PUBLIC SCHOOLS, ZONE – II ODISHA

QUESTION BANK FOR CLASS – XI

(2015 – 16)

MATHEMATICS

(Chapter – 1 to 8)

CHAPTER – 1

SETS

SECTION – A(One mark questions)

1. Find n {P [P (P(Φ))]} .

2. Write the set { 2, 4, 8, 16, 32} in set – builder form

3. If A= {1,2,3,4,5} & B = {2,4,6,8}, find A – B .

4.Write A = {x: x is an integer & $-3 \leq x < 2$} in roster form.

5. List all the element of the set A = { x : x is an integer, $x^2 \leq 4$}

6. If n(A) = 10, n(B) = 8, then write the maximum and minimum number of element that

   $A \cap B$ can have.

7. What is the number of non-empty subsets of the set A= { 1,2,3,4 }?

8. Draw a Venn diagram showing $A^c \cap (C-B)$ for three non-empty sets A,B and C with Universal set X.

9. Describe the following set in set builder form: $\left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots \ldots\right\}$.

10. Let A and B have 4 and 7 elements respectively. Then find the maximum number of elements in $A \cup B$.

11. Write the set $\{ \frac{1}{2}, \frac{2}{5}, \frac{3}{10}, \frac{4}{17}, \frac{5}{26}, \frac{6}{37}, \frac{7}{50} \}$ in set builder form .

12. If ‘ A ‘ has ‘n’ elements , write the number of proper subsets of ‘ A ‘ .

SECTION – B(Four mark questions)

1. Verify $(A \cap B)' = A' \cup B'$, where A={3, 4, 5, 6} and B = {3, 6, 7, 8} are subsets of

   U= {1, 2, 3, 4, 5, 6, 7, 8}

2. Let A,B&C be the sets such that $A \cup B = A \cup C$ & $A \cap B = A \cap C$.

   Show that B = C.

3. If A = {1, 2, 3} B = { 4, 5, 6 } and C = { 7, 8, 9}, verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup c)$

4. For any two sets A and B prove that $(A \cup B) = (A \cap B) \Leftrightarrow A = B$

5. If A U B =C and A n B= ∅,prove that A = C - B.

6. Assume that P (A) = P (B) . Show that A = B.
7. Using properties of sets , Show that (i) $A \cup (A \cap B) = A$ (ii) $A \cap (A \cup B) = A$
8. For any two sets A and B prone that $P(A \cap B) = P(A) \cap P(B)$ What shall you tell about $P(A \cup B) = P(A) \cup P(B)$. Justify your answer.
9. Let A,B be two sets such that $A \cup X = B \cup X$ & $A \cap X = B \cap X = \Phi$. for some set X

Show that A = B.

10. Let U = $\{a, b, c, d, e, f, g\}$, A = $\{b, c, f\}$ and B = $\{a, g\}$ .Show that A – B = A ∩ B' .

SECTION – C(Six mark questions)

1 In a survey of 60 people, it was found that 25 people read newspaper H , 26 read news paper P ,26readnewspaper Z , 9 read both H and Z , 11 read both H and T , 8 read both T and Z and 3 read all three newspapers. Find the number of people who read exactly one newspaper.

2. In a class of 140 students , 60 play Football,48 play Hockey , 75 play Cricket ,30 play Hockey&Cricket,18play Football &Cricket ,12 play Football &Hockey & 8play all the three games . find the number of
   i) students who do not play any of these three games.
   ii) students who play only Cricket.
   iii)students who play Football & Hockey ,but not Cricket.
3. A class has 175 students. The students studying mathematics 100, physics 70,chemistry 46,mathematics and physics 30, mathematics and chemistry 28,physics and chemistry 23, mathematics, physics and chemistry 18.
   i. How many students are enrolled in mathematics alone?
   ii. How many students have not offered any one of these three subjects.
   iii. How many students are enrolled in physics alone.
4. A school awarded 38 medals in football, 15 in basketball and 20 in cricket. If these medals went to a total of 58 children and only 3 children got medals in all the three sports, how many received medals in exactly two of the sports?
   (i)mention at least two values that children must learn from sports.
   (ii) how are sports important for the physical growth of children?
5. In a Survey of 100 people, it was found that 28 read newspaper A, 30 read newspaper B and 42 read newspaper C, 8 read newspaper A and B, 10 read newspaper A and C, 5 read newspaper B and C and 3 read all the three newspapers. Find (i) How many read none of the three newspaper?
   (ii) How many read newspaper C only?

6. In a survey of 500 students of a school, 285 were listed as drinking Limca, 195 as drinking Mirinda , 115 as drinking Pepsi , 45 both Limca and Pepsi , 70 both Limca and Mirinda , 50 both Mirinda and Pepsi , 50 do not take any of the three . How many take all the three types of cold drinks ? How many take exactly one of the three ? What values do you get from the above information ?

CHAPTER –2

RELATIONS AND FUNCTIONS

SECTION – A(One mark questions)

1. Find x and y , if (x+6 , y – 2) = (0, 6)

2. Find the domain of f(x) = $\sqrt{2-x}$.

3. Find the domain of the function f(x) = $\dfrac{7x^4 - x^2 + 2}{x^2 - 4x + 3}$

4. What is the range of signum function?
5. Find the domain of logarithmic function log(x-3).
6. If $\left(\frac{x}{3} + 1 ,\ y - \frac{2}{3}\right) = \left(\frac{5}{3} ,\ \frac{1}{3}\right)$, Find the values of 'x' and 'y' .

SECTION – B(Four mark questions)

1. Let A = { 1, 2, 3, 4} and B = { 1, 4, 9, 16, 25} and R be a relation defined from A to B as R = { (x, y) : x ∈ A and y ∈ B and y = x^2 }

   (i) Depict this relation using arrow diagram. (ii) Find domain of R

   (iii) Find range of R (iv) Write codomain of R

   (v) Does the truthfulness and honesty may have any relation

2. Find the domain and the range of the function f(x) = $\sqrt{16 - x^2}$

3. Find the domain and range of the function f(x) = $\frac{1}{1-x^2}$,x∈R

4. Let $f = \{(1,1),(2,3),(0,1),(-1,-3)\}$ is a function on Z defined by $(x) = ax + b$, find the values of a and b

5. Let $f(x) = x^2$ and $g(x) = 2x + 1$ be two real functions. Find $(f+g),(f-g),(fg) and \frac{f}{g}$

SECTION – C(Six mark questions)

1. Let R be the relation on the set Z of all integers defined by R = {(x,y):x – y is divisible by n}. Prove that

a) (x,y) $\in$R for all x $\in$ Z

b) (x,y) $\in$R $\Rightarrow$ (y,x) $\in$R for all x,y $\in$Z

c) (x,y) $\in$R & (y,z) $\in$R $\Rightarrow$ (x,z) $\in$ R for all x,y,z $\in$R

2. Find domain & range of the real function f(x) defined by f(x) = $\begin{cases} 1-x\ , x<0 \\ 1\ , x=0 \\ x+1\ , x>0 \end{cases}$

and draw its graph.

3. . a. if $f(x) = x^2,\ find\ \frac{f(1.1)-f(1)}{1.1-1}$

b. Let R be a relation from Q to Q defined by $R = \{(a,b): a,b \in Q\ and\ a-b \in Z\}$ show that

i) $(a,a) \in R$ for all $a \in Q$

ii) $(a,b) \in R \Rightarrow (b,a) \in R$

iii) $(a,b) \in R, (b,c) \in R \Rightarrow (a,c) \in R$

4. a) If f(x) = $\frac{1+x}{1-x}$, find the value of $\frac{f(x).f(x^2)}{1+[f(x)]^2}$

(b) let f be the subset of Z×Z defined by f= { (ab,a+b): a,b ∈ Z}. Show that f is not a function.

5. Find the domain and range of the real function f defined by

(i) f(x) = $\sqrt{(x-1)}$ (ii) f(x) = $|x^2 - 1|$

CHAPTER –3

TRIGONOMETRIC FUNCTIONS

SECTION – B(Four mark questions)

1. Prove that : Sin x + Sin 3x + Sin 5x + Sin 7x = 4 Cos x . Cos 2x . Sin 4x

2. Prove that : $\sqrt{2+\sqrt{2+\sqrt{2+2Cos8\theta}}}$ = 2Cos θ

3. Find the general solution for the equation Sin 2x – Sin 4x + Sin 6x = 0

4. Show that tan3x tan2x tanx = tan3x – tan2x – tanx .

5. Find the general solution for the equation $\sec^2 2x = 1 - \tan 2x$

6. Prove that $4\sin A \ \sin(60^0 - A)\sin(60^0 + A) = \sin 3A$

7. Prove that $\sin 20^0 \sin 40^0 \sin 60^0 \sin 80^0 = \frac{3}{16}$.

8. Prove that tan13A – tan9A – tan4A = tan13A. tan 9A. tan4A

9. Solve for x : cos 2x – 2 sin x – 1 = 0

10. In any triangle ABC, prove that Sin $\frac{B-C}{2} = \frac{b-c}{a}\cos\frac{A}{2}$

11. If sinA $=\frac{3}{5}$, $0< A< \pi/2$ and cosB $=\frac{-12}{13}$, $\pi < B < \frac{3\pi}{2}$ then find the value of tan(A-B).

12. Solve the equation (1-tanθ)(1+sin2θ) = 1+tanθ for its general solution.

13. Find the value of $\tan\frac{\pi}{8}$

14. Prove that $\sin^3\alpha + \sin^3(\frac{2\pi}{3}+\alpha) + \sin^3(\frac{4\pi}{3}+\alpha) = -\frac{3}{4}\sin 3\alpha$.

15. InΔABC , Prove that a cos A + b cos B + c cos C = 2a sin B sin C.

16. InΔABC , Prove that $\frac{\sin B}{\sin C} = \frac{c-a\cos B}{b-a\cos C}$

17. If Sinx $=\frac{3}{5}$,Cosy $=\frac{-12}{13}$,where x and yboth lie in second quadrant, find the value of Sin(x + y)

18. Solve the trigonometric equation $2\ sin^2 x + sin^2 2x = 2$

19. Solve the trigonometric equation $\cos 3x + \cos x - 2\cos 2x = 0$

20. Prove that : sin x + sin 3x + sin 5x + sin 7x = 4 cos x .cos 2x . sin 4x

21. Prove that : $\frac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$

SECTION – C(Six mark questions)

1. In and ΔABC , prove that $\frac{a^2 Sin(B-C)}{Sin\ B+Sin\ C} + \frac{b^2 Sin(C-A)}{Sin\ C+Sin\ A} + \frac{c^2 Sin(A-B)}{Sin\ A+Sin\ B} = 0$

2. In a triangle ABC, prove that

$$(b^2 - c^2) \cot A + (c^2 - a^2) \cot B + (a^2 - b^2) \cot C = 0$$

3. In any Δ prove that $\frac{b^2 - c^2}{a^2}\sin 2A + \frac{c^2 - a^2}{b^2}\sin 2B + \frac{a^2 - b^2}{c^2}\sin 2C = 0$

4. Find the value of $\cos^4\frac{\pi}{8} + \cos^4\frac{3\pi}{8} + \cos^4\frac{5\pi}{8} + \cos^4\frac{7\pi}{8}$.

5. Prove that $\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$

6. In any triangle ABC , Prove that $(b - c)\cot\frac{A}{2} + (c - a)\cot\frac{B}{2} + (a - b)\cot\frac{C}{2} = 0$

CHAPTER –4

PRINCIPLE OF MATHEMATICAL INDUCTION

SECTION – C(Six mark questions)

1. Using the principle of mathematical induction , prove that

$$1 . 3 + 2 . 3^2 + 3 . 3^3 + \ldots\ldots\ldots\ldots\ldots + n . 3^n = \frac{(2n-1).3^{n+1}+3}{4}$$

2. Prove by mathematical induction that $2 . 7^n + 3 . 5^n - 5$ is divided by 24 for all $n \in N$.

3. Using principle of mathematical induction, prove that $3^{2n+2} - 8n - 9$ is divisible by 8.

4. Using principle of mathematical induction, prove that

$$1.3 + 2.3^2 + 3.3^3 \ldots\ldots\ldots + n.3^n = \frac{(2n-1)3^{n+1} + 3}{4}$$

5. Show by using Principal of Mathematical Induction that

$$1+2+3+\ldots\ldots\ldots\ldots+n < \frac{1}{8}(2n+1)^2.$$

6. Using Principle of Mathematical Induction, Prove that

$$\frac{1}{1.2.3} + \frac{1}{2.3.4} + \frac{1}{3.4.5} + \ldots\ldots\ldots\ldots + \frac{1}{n.(n+1)(n+2)} = \frac{n(n+3)}{4(n+1)(n+2)}, \ n \in N$$

CHAPTER – 5

COMPLEX NUMBERS AND QUADRATIC EQUATIONS

SECTION – A(One mark questions)

1. Show that $i^n + i^{n+1} + i^{n+2} + i^{n+3} = 0 , \forall n \in N$

2. Find the modulus of the complex number $5 - i^3$

3. Solve: $x^2 + 4 = 0$

4. Find the multiplicative inverse of $4 - 3i$.

5. Find the multiplicative inverse of $-3 + 4i$

6. Solve the equation $x^2 + x + 1 = 0$

SECTION – B(Four mark questions)

1. Solve : $\sqrt{2}x^2 + x + \sqrt{2} = 0$

2. Write the complex number $\sqrt{3} + i$ into polar form.

3. Solve : i) $x^2 + 5x + 25/2 = 0$

   ii) $x^2 + 4ix - 4 = 0$

4. Write the complex number $\sqrt{3} + i$ into polar form .

5. Find the conjugate & modulus of the complex number $\frac{2+3i}{3+2i}$.

6. Find the modules and argument of the complex number $\frac{1+2i}{1-3i}$

7. If $x + iy = (u+iv)^{\frac{1}{3}}$ then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$

8. Find the square root of $8 - 15i$

9. If $z_1 = 2-i$ and $z_2 = 1+i$,then find the value of $\left|\frac{z_1+z_{2+1}}{z_1-z_2+i}\right|$

10. Find the square root of $-3 - 4i$.

11. Convert the given complex number $\frac{1+7i}{(2-i)^2}$ into polar form

12. Find the square root of $1 + i$

SECTION – C(Six mark questions)

1. If a + ib = $\frac{x+i}{x-i}$, where x is real, then prove that $a^2 + b^2 = 1$ and $\frac{b}{a} = \frac{2x}{x^2-1}$

2. If x + iy = $\sqrt{\frac{a-ib}{c-id}}$,then prove that $x^2 + y^2 = \sqrt{\frac{a^2+b^2}{c^2+d^2}}$

3. Find the values of x and y if $\frac{(1+i)x-2i}{3+i} + \frac{(2-3i)y+i}{3-i} = i$

4. Express $\left(\frac{1}{1-2i} + \frac{3}{1+i}\right)\left(\frac{3+4i}{2-4i}\right)$ in the form a+ib.

5. Write the complex number $Z = \frac{2+i}{(1+i)(1-2i)}$ into polar form

6. Find the general value of real θ such that $\frac{3+2i\sin\theta}{1-2i\sin\theta}$ is purely real.

7. Convert the complex number z = $\frac{i-1}{\cos\frac{\pi}{3}+i\sin\frac{\pi}{3}}$ in the polar form.

8. Convert the complex number $\frac{-16}{1+i\sqrt{3}}$ into polar form.

9. If α and β are two different complex numbers with $|\beta| = 1$,then find $\left|\frac{\beta-\alpha}{1-\bar{\alpha}\beta}\right|$.

10. If x – iy = $\sqrt{\frac{a-ib}{c-id}}$, Prove that $x^2 + y^2 = \frac{a^2+b^2}{c^2+d^2}$.

12. If a + ib = $\frac{(x+i)^2}{2x^2+1}$ Prove that $a^2 + b^2 = \frac{(x^2+1)^2}{(2x^2+1)^2}$

CHAPTER – 6

LINEAR INEQUALITIES

SECTION – A(One mark questions)

1. Solve: 3x – 5 < x +7.

2. Solve the inequation – 12 < 3x – 5 ≤ – 4

3. Write the solution set of the inequation $\frac{x+8}{x+2} > 1$.
4. Solve 4x + 3 < 5x + 7.
5. Solve : x + 5 > 4 x − 10 , for x is a natural number

SECTION – B&C(Four & Six mark questions)

1. Solve the inequality : $\frac{x}{4} < \frac{5x-2}{3} - \frac{7x-3}{5}$

2. Solve the following inequalities $x+y \le 9$, $y>x$ & $x\ge1$ graphically

3. Solve the inequality $-3 \le 4 - \frac{7x}{2} \le 18$.

4. Solve the following system of inequation graphically

   $3x + 2y \le 24$, $x + 2y \le 16$ $x + y \le 10$ $x \ge o$ $y \ge o$

5. A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18%

6. Solve the in equation : $\frac{1}{2}(\frac{3}{5}x + 4) \ge \frac{1}{3}(x - 6)$.

7. A man wants to cut three lengths from a single piece of board of length 91cm. The second is to be 3cm longer than the shortest and the third length is to be twice as long as the shortest. What are the possible lengths for the shortest board if the third piece is to be at least 5cm longer than the second.

8. How many litres of water will have to be added to 1125 liters of the 45% solution of acid so that the resulting mixture will contain more than 25% but less than 30% acid content?

9. Solve graphically, the following system of inequalities:
   $3y - 2x < 4$, $x + 3y > 3$; $x + y \le 5$; $x \ge 0, y \ge 0$

10. Solve graphically, the following system of inequalities:
    $3x + 4y \le 60$, $x + 3y \le 30$, $x \ge 0, y \ge 0$.

11. Solve the system of inequalities graphically :
    $x + 2y \le 10$, $x + y \ge 1$, $x - y \le 0$, $x \ge 0$, $y \ge 0$

12. Solve the following inequalities $3x + 2y \le 12$, $x + y \ge 8$, $-x + y \ge 4$, $5x \le 10$ and

    $x , y \ge 0$ graphically

13. Rajeev needs a minimum of 360 marks in four tests in a mathematics course to obtain an" A " grade. On his first three tests , he scored 88 ,96 , 79 marks. What should his score be in the fourth test so that he can make an "A" grade. What value he should develop for it.

CHAPTER – 7

PERMUTATION AND COMBINATION

SECTION – A(One mark questions)

1. If $15c_{3r} = 15_{c_{r+3}}$, find r
2. If $n_{C_9} = n_{C_8}$, Find $n_{C_{17}}$.
3. find 'n' if : $^{n-1}P_3$: $^{n}P_4$ = 1 : 9

SECTION – B(Four mark questions)

1. Determine n , if $^{2n}C_3$: $^{n}C_2$ = 12 : 1

2. Find r , if if $^{5}P_r$ = 2 . $^{6}P_{r-1}$

3.How many distinct permutations of the letters in 'MISSISSIPPI' do the four I's not come together ?

4. How many words can be formed by taking 4 letters at a time out of the letters of the word "MATHEMATICS".

5. In how many different ways , the letters of the word "ALGEBRA can be arranged in a row , if

   i) the two A's are together ?
   ii) the two A's are not together ?

6. If $^{2n+1}p_{n-1}$: $^{2n-1}p_{n}$ =3:5 find n.

7. Prove that $^{n}p_{r} = r . ^{n-1}p_{r-1} + ^{n-1}p_{r}$

8. How many numbers greater than 1000000 can be formed by using the digits

   1, 2, 0, 2, 4, 2, 4?

9. Determine n if $2n_{c_3}: n_{c_3} = 11:1$
10. Find the number of words which can be made using all the letters of the word AGAIN. If these words are written as dictionary, what will be the fiftieth word?
11. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) at least one boy and one girl? (ii) at least 3 boys?
12. Find the number of arrangements of the letters of the world 'REPUBLIC'. How many arrangements start with a vowel? Do you remember Republic Day? What is its significance?
13.How many diagonals are there in a polygon of 16 sides ?
14. A delegation of 6 members is to be sent abroad out of 12 members. In how many ways can the selection be made so that a particular member is (i) included (ii) excluded ?
15. Find the values of ' n ' & ' r ' if $^{n+1}C_{r+1}$: $^{n}C_{r}$: $^{n-1}C_{r-1}$ = 11 : 6 : 3

16. In how many ways can 7 plus (+) signs and 4 minus (-) signs be arranged in a row so that no two minus signs are together?
17. A boy has 3 library tickets and 8 books of his interest in the library. Of these 8, he does not want to borrow Mathematics part – II , unless Mathematics part – I is also borrowed. In how many ways can he choose the three books to be borrowed?
18. Out of 8 sailors on a boat, 3 can work on one side and 2 on the other side. In how many ways can sailors be arranged on the boat?

SECTION – C(Six mark questions)

1. A committee of 7 members has to be formed from 9 boys and 4 girls . In how many ways can this be done when the committee consists of

(i) exactly 3 girls (ii) atleast 3 girls (iii) atmost 3 girls

2. Find the number of ways in which 5 boys & 5 girls be seated in a row, so that

i) no two girls may sit together.

ii) all the girls & all the boys sit together.

iii) all the girls are never sit together.

3. A committee of 12 is to be formed from 9 women and 8 men. In how many ways can this be done if at least five women have to be included in a committee? In how many of these committees.

i) the women are in majority

ii) the men are in majority.

Why do you think it is necessary to have women members in a committee? Do they need to be given importance ? Give reasons.

4. What are the number of ways of choosing 4 cards from a pack of 52 playing cards if
(i) All four cards are of the same suit (ii) the four cards belong to four different suits.
(iii) all are face cards (iv) two are red cards and two are black cards.

CHAPTER – 8

BINOMIAL THEOREM

SECTION – A(One mark questions)

1. Write the number of terms in the expansion $(1+\sqrt{5}\,x)^7 + (1-\sqrt{5}\,x)^7$

2. What is the number of distinct terms in the expansion of $(\sqrt{a}+\sqrt{b})^{10}+(\sqrt{a}-\sqrt{b})^{10}$?
3. Find a, if the 17^{th} and 18^{th} terms in the expansion of $(2 + a)^{50}$ are equal ?
4. Find the number of terms of the expansion $(1 - 3x + 3x^2 - x^3)^{23}$

SECTION – B(Four mark questions)

1. In the binomial expansion of $(x + y)^n$ the coefficient of 4^{th} and 13^{th} terms are equal.Find the value of n

2. Find the middle terms in the expansion of $(3x - \frac{x^3}{6})^9$

3. Find the constant term in the expansion of $(x - \frac{1}{x})^{10}$

4. If the coefficients of 2_{nd} , 3_{rd} & 4_{th} terms in expansion of $(1 + x)^n$ are in A.P, then find the value of n.

5. Find the 5^{th} term from the end in the expansion of $(\frac{x^3}{2} - \frac{2}{x^2})^6$.

6. Find the middle terms in the expansion of $(3x - \frac{x^3}{6})^9$.

7. Find the 5^{th} term from the end in the expression of $\left(\frac{x^3}{2} - \frac{2}{x^2}\right)^9$

8. Using binomial theorem prove that $6^{2n} - 35n - 1$ is divisible by 1225

9. Find the middle term in the expansion of $\left(\frac{2x}{3} - \frac{3}{2x}\right)^6$

10. Find the coefficient of x^5 in the expansion of the product $(1+2x)^6(1-x)^7$.
11. If a and b are distinct integers, prove that a^n-b^n is divisible by a-b, where n is a positive integer.
12. Find the middle term in the expansion of $(\frac{x}{3} + 9y)^{10}$

13. Find the middle term in the expansion of $\left(\frac{2x^2}{3} + \frac{3}{2x^2}\right)^{10}$

14. Find the term independent of 'x' in the expansion : $\left(\sqrt[3]{x} + \frac{1}{2\sqrt[3]{x}} \right)^{18}$, x > 0.

15. Show that the coefficient of the middle term in the expansion of $(1 + x)^{2n}$ is equal to the sum of the coefficient of two middle terms in the expansion of $(1 + x)^{2n-1}$.

SECTION – C(Six mark questions)

1. The 2^{nd} , 3^{rd} and 4^{th} terms in the binomial expansion $(x + a)^n$ are 240 , 720 and 1080 respectively . Find the value of x , a and n.

2. Find the value of n , if the ratio of 5^{th} term from the beginning to the 5^{th} term from the end in the extension of $(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}})^n$ is $\sqrt{6} : 1$.

3. If coefficients of three consecutive terms in the expansion of $(1+x)^n$ be165,330and462,Find n.

4. If the coefficient of three consecutive terms in the expansion of $(1+a)^n$ are in the ratio 1:7:42, find n.

5. Find a, b, and n in the expansion of $(a + b)^n$ if the first three terms of the expansion are 729, 7290, and 30375 respectively.

6. If the coefficients of a^{r-1}, a^r and a^{r+1} in the expansion of $(1 + a)^n$ are in the arithmetic progression, prove that $n^2 - n(4r + 1) + 4r^2 - 2 = 0$

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