REVISION SHEET

SUBJECT: MATHEMATICS   **CLASS-XI**   **TERM 1**

CHAPTER SETS

Ques 1 How many elements has P (A), if A $=\emptyset$.

Ques 2 in class xi of a certain school , there are 20 students in a chemistry class and 30 students in a physics class . find the number of students which are either in chemistry class or In physics class in following cases

  (i) the two classes meet at the same time

  (ii) the two classes meet at different time and 10 students study both the subjects

Ques 3 in a survey of 100 students , the number of students studying the various languages were found

  To be : English only 18 , English but not hindi 23 , eng and Sanskrit 8,eng 26, Sanskrit 48, skt and hindi

   8 , no languages 24 . find

  (i) how many students were studying hindi

  (ii) how many students were studying English and hindi

Ques4 Out of 100 students, 15 passed in English, 12 passed in Mathematics, 8 in Science, 6 in English 7 & Mathematics, 7 in Mathematics 7 Science, 4 in English 7 Science, 4 in all the three. Find how many passed

1) in English & Mathematics but not in Science   **2)** in Mathematics & Science but not in English.

3) in Mathematics only   **4)** in more than one subject only.

Ques 5 if A and B are two sets such that n(A) =17 , n(B) =23 And n(AUB)=38

  Find (i) n(A$\cap$ B)   (ii) n(A-B)   (iii) n(B-A)

Ques 6 if total elements 50 , n(A) =30 , n(A$\cap$ B)=12   and $n(AUB)' = 15$ then find (i) n(B)

   (II) n(B-A)

Ques 7 A and B are two sets such that n(A-B)=14+x, n(B-A)=3x and $n(A\cap B) = x$ if n(A)=n(B). find x

 Ques 8. Which of the following is not correct?
(a) $N \subset R$ (b) $N \subset Q$ (c) $Q \subset R$ (d) $N \subset T$
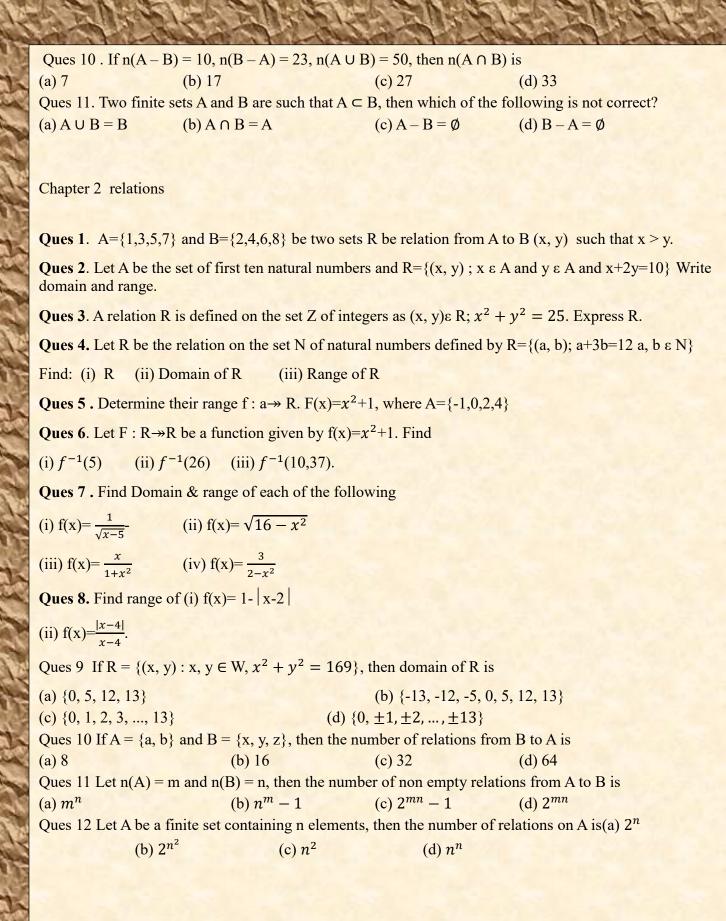Ques 9 On real axis if A = [1, 5] and B = [3, 9], then A – B is
(a) (5, 9)   (b) (1, 3)   (c) [5, 9)   (d) [1, 3)

Ques 10 . If n(A – B) = 10, n(B – A) = 23, n(A ∪ B) = 50, then n(A ∩ B) is

(a) 7   (b) 17   (c) 27   (d) 33

Ques 11. Two finite sets A and B are such that A ⊂ B, then which of the following is not correct?

(a) A ∪ B = B   (b) A ∩ B = A   (c) A – B = Ø   (d) B – A = Ø

Chapter 2 relations

Ques 1. A={1,3,5,7} and B={2,4,6,8} be two sets R be relation from A to B (x, y) such that x > y.

Ques 2. Let A be the set of first ten natural numbers and R={(x, y) ; x ε A and y ε A and x+2y=10} Write domain and range.

Ques 3. A relation R is defined on the set Z of integers as (x, y)ε R; $x^2 + y^2 = 25$. Express R.

Ques 4. Let R be the relation on the set N of natural numbers defined by R={(a, b); a+3b=12 a, b ε N}

Find: (i) R   (ii) Domain of R   (iii) Range of R

Ques 5 . Determine their range f : a↠ R. F(x)=x^2+1, where A={-1,0,2,4}

Ques 6. Let F : R↠R be a function given by f(x)=x^2+1. Find

(i) $f^{-1}(5)$ (ii) $f^{-1}(26)$ (iii) $f^{-1}(10,37)$.

Ques 7 . Find Domain & range of each of the following

(i) f(x)= $\frac{1}{\sqrt{x-5}}$ (ii) f(x)= $\sqrt{16 - x^2}$

(iii) f(x)= $\frac{x}{1+x^2}$ (iv) f(x)= $\frac{3}{2-x^2}$

Ques 8. Find range of (i) f(x)= 1-$|x-2|$

(ii) f(x)=$\frac{|x-4|}{x-4}$.

Ques 9 If R = {(x, y) : x, y ∈ W, $x^2 + y^2 = 169$}, then domain of R is

(a) {0, 5, 12, 13}   (b) {-13, -12, -5, 0, 5, 12, 13}

(c) {0, 1, 2, 3, ..., 13}   (d) {0, ±1, ±2, ..., ±13}

Ques 10 If A = {a, b} and B = {x, y, z}, then the number of relations from B to A is

(a) 8   (b) 16   (c) 32   (d) 64

Ques 11 Let n(A) = m and n(B) = n, then the number of non empty relations from A to B is

(a) m^n (b) $n^m - 1$ (c) $2^{mn} - 1$ (d) 2^{mn}

Ques 12 Let A be a finite set containing n elements, then the number of relations on A is(a) 2^n

         (b) 2^{n^2} (c) n^2 (d) n^n

Chapter 3 trigonometric functions

Ques 1 the angles of a triangle are in A.P. the number of degrees in the least is to the number of radians in the greatest is $60:\pi$. Find the angles in degrees

Ques 2. A horse is tied to a post by a rope . if the horse moves along a circular path always keeping the rope

Tight and describe 88 mtrs when it has traced out $72°$ at the centre . find the length of the rope.

Ques 3. A railway train is travelling on a circular curve of 1500 mtrs radius at the rate of 66 km/hr. through

What angle has it turned in 10 seconds

Ques 4 If $\tan \alpha = \frac{m}{m+1}$ and $\tan \beta = \frac{1}{2m+1}$ prove that $\alpha + \beta = \frac{\pi}{4}$

Ques 5 prove that$Sin^2 A = Cos^2(A - B) + Cos^2 B - 2\cos(A - B)\, CosAcosB$

Ques 6 Prove that $\sin^2\left(\frac{\pi}{8} + \frac{A}{2}\right) - \sin^2\left(\frac{\pi}{8} - \frac{A}{2}\right) = \frac{1}{\sqrt{2}} sinA$

Ques 7 prove that $\tan 70° = tan20° + 2tan50°$

Ques 8 if $\tan(\alpha + \theta) = ntan(\alpha - \theta)$ show that $(n+1)\sin2\theta = (n-1)\sin2\alpha$ (apply C&D)

Ques 9. IF $\sin\alpha + \sin\beta = a$ and $\cos\alpha + \cos\beta = b$ show that

(i) $\cos(\alpha + \beta) = \frac{b^2 - a^2}{b^2 + a^2}$ (ii) $\sin(\alpha + \beta) = \frac{2ab}{a^2 + b^2}$

Ques 10 If θ lies in second quadrant, then the quadrant in which $-\frac{\theta}{2}$ lies is
(a) I quadrant   (b) II quadrant (c) III quadrant   (d) IV quadrant
 Ques 11. The angle in degree measure between two hands of a clock at 8 : 30 p.m. is
(a) 55^0 (b) 66^0 (c) 75^0 (d) 80^0
Ques 12 The angle subtended by an arc of length 20 cm at the centre of circle when radius is 14 cm is
(a) $\frac{5}{7}$ radians   (b) $\frac{10}{7}$ radians   (c) $\frac{5}{14}$ radians   (d) $\frac{7}{10}$ radians
Ques 13 The value of $tan75^0 - cot75^0$ is equal
(a) $2\sqrt{3}$ (b) $2 + \sqrt{3}$ (c) $2 - \sqrt{3}$ (d) 1
Ques 14 The value of $tan5A - tan3A - tan2A$ is equal to
(a) $tan5A.\,tan3A.\,tan2A$ (b) $-tan5A.\,tan3A.\,tan2A$
(c) $tan3A.\,tan2A - tan2A.\,tan5A - tan5A.\,tan2A$ (d) none

Chapter 4 complex numbers

Ques2 Find the value of x and y if

(i) $(3x-7) + 2yi = -5y + (5+x)\,i$ (ii) $\frac{x-1}{3+i} + \frac{y-1}{3-i} = i$

(iii) $(x^4 + 2xi) - (3x^2 + iy) = (3 - 5i) + (1 + 2yi)$

Ques3 If $a + ib = \frac{c+i}{c-i}$ Prove $a^2 + b^2 = 1$ and $\frac{b}{a} = \frac{2c}{c^2-1}$

Ques4 If $(x + iy)^{\frac{1}{3}} = a + ib$ show that $\frac{x}{a} + \frac{y}{b} = 4(a^2 - b^2)$

Ques5 Find conjugate of $\frac{(2+3i)^2}{2-i}$

Ques6 Find x and y for which complex numbers $-3 + x^2 yi$ and $x^2 + y + 4i$ conjugate of each other.

Ques7 Find multiplicative inverse of $(2 + \sqrt{3i}\,)^2$

Ques8 If $\frac{(a+i)^2}{2a-i} = P + iq$ show that $P^2 + q^2 = \frac{(a^2+1)^2}{4a^2+1}$

Ques9 If $(1+i)(1 + 2i)(1 + 3i)....(1+ni) = (x + iy)$ show that $2 \times 5 \times 10 \times ... \times (1 + n^2) = x^2 + y^2$

Ques 10 If $8x + i(2x - y) = 3 - 8i$ and x, y $\in$ R, then the values of x and y are
(a) $x = \frac{3}{8}, y = \frac{35}{4}$ 　　　　　　　　　(b) $x = -\frac{3}{8}, y = \frac{35}{4}$
(c) $x = \frac{3}{8}, y = -\frac{35}{4}$ 　　　　　　　　(d) $x = -\frac{3}{8}, y = -\frac{35}{4}$
Ques 11 The value of $1 + i + i^2 + \cdots + i^n$ is
(a) positive 　　　　(b) negative 　　　　(c) 0 　　　　(d) cannot be determined
Ques 12 If $z = x + iy$ satisfies $|z + 1| = 1$, then
(a) x = 0 　　　　(b) $(x - 1)^2 + y^2 = 1$ 　　(c) y = 0 　　(d) $(x + 1)^2 + y^2 = 1$
Ques 13 If $z = x + iy$ satisfies $|z + 1 - i| = |z - 1 + i|$, then
(a) y = x 　　　　(b) y = -x 　　　　(c) x - y + 1 = 0 　　(d) x + y - 1 = 0
Ques 14 Number of solutions of the equations $z^2 + |z|^2 = 0$ is
(a) 1 　　　　　　(b) 2 　　　　　　(c) 3 　　　　(d) infinitely many
Ques15 When x = 1+2i Find the value of $x^3 + 7x^2 - x + 16$

CHAPTER 5 LINEAR INEQUALITY

Ques1. Solve the Following inequations :

(i) $\frac{1}{x-2} < 0$ (ii) $\frac{x-3}{x-5} > 0$

Ques2. Solve the Following system of inequations

(i) $2(2x+3) - 10 < 6(x-2)$, $\frac{2x-3}{4} + 6 \geq 2 + \frac{4x}{3}$

Ques3. Solve $-5 \leq \frac{2-3x}{4} \leq 9$

Ques4. Solve $|x - 2| \geq 5$

Ques6. The marks scored by salman in two tests were 65 & 70. Find the minimum marks he should score in third test to have an average of atleast 65 marks.

Ques 7 If $|x - 2| \geq 7, \ x \in R$, then

(a) $x \in [-5, 9]$ (b) $x \in (-5, 9]$ (c) $x \in (-\infty, -5] \cup (2, \infty)$ (d) $x \in (-\infty, -5] \cup (9, \infty)$

Ques 8 . If $|2x + 3| < 7$, x ∈ R, then

(a) $x \in (-5, 2]$ (b) $x \in (-5, 2)$ (c) $x \in (-\infty, -5) \cup (2, \infty)$ (d) $x \in (-\infty, -5] \cup [2, \infty)$

Ques 9If $x \leq 8$, then

(a) $-x \leq -8$ (b) $-x \geq -8$ (c) $-x < -8$ (d) $-x > -8$

Ques 10 x and b are real numbers. If b > 0 and $|x| > b$, then

(a) $x \in (-b, \infty)$ (b) $x \in [-\infty, b)$ (c) $x \in (-b, b)$ (d) $x \in (-\infty, -b) \cup (b, \infty)$

Ques 11 If $x \in R$, $|x| \leq 9$, then

(a) x ≥ 9 (b) $-9 < x < 9$ (c) x ≤ −9 (d) $-9 < -x \leq 9$

Chapter 6 PERMUTATIONS AND COMBINATIONS

Ques 1 For a set of five true /false questions, no student has written all correct answers and no two students have given the same sequence of answers. what is the maximum no. of students in the class, for this to possible?

Ques 2. Find total number of ways in which n distinct objects can be put into two different boxes.

Ques 3 A mint prepares metallic calenders specifying months, dates, and days in the form of monthly sheets (one plate for each month). How many types of calenders should it prepares to serve for all possibilities in future years.

Ques 4. There are four parcels and five post offices. In how many ways can the parcels be sent by registered posts.

Ques 5. How many three digits odd numbers are there.

Ques 6. Find n if $^{2n+1}_{n-1}p : ^{2n-1}_{n}p = 3 : 5$

Ques 7. Prove that if r≤ $s \leq n$ then $^{n}_{s}p$ id divisible by $^{n}_{r}p$.

Ques 8. When a group of photographs is taken, all the seven teachers should be in the first row an all the twenty students should be in the second row. If the two comers of the second row are reserved for the two tallest students, interchangeable only between them and if middle seat of front row is reserved for the principal, how many arrangements are possible.

Ques 9. A code word is to consists of two distinct English alphabets followed by two distinct numbers from 1 to 9 e.g. CA23. How many such code words are there. How many of them ended with even digits

Ques 10 The principal wants to arrange 5 students on the platform such that the boy "SALIM" occupies the second position such that the girl "SITA" is always adjacent to the girl "RITA". How many such arrangements are possible.

Ques 11. In how many ways three girls and nine boys can be seated in two vans, each having numbered seats, 3 in the front and 4 at back? How many seating arrangements are possible if 3 girls sit together in a back row on adjacent seats

Ques 12. A tea party is arranged for 16 persons along two sides of a long table with 8 chairs on each side. Four persons wish to sit on one particular and two on the other sides. In how many ways can they be seated.

Ques 13. A committee of 5 is to be formed out of 6 gents and 4 ladies. In how many ways this can be done.when

(i) Atleast two ladies are included.   (ii) Atmost two ladies are included.

CHAPTER 7   BINOMIAL THEOREM

Ques 1 Expand (i) $\left(\frac{2}{x} - \frac{x}{2}\right)^5$ (ii) $\left(x + \frac{1}{x}\right)^6$

Ques 2 Using the binomial theorem expand $(102)^5$

Ques 3 Prove that $\sum_{r=0}^{n} 3^r \, {}^n_r C = 4^n$.