

## WORKSHEET – SA I (2011-2012)

STD. : X

### MATHEMATICS

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#### ONE MARK QUESTIONS

1. State Euclid's Division Lemma ?
2. State Fundamental Theorem of Arithmetic's.
3. Condition required for decimal representation to be non-terminating.
4. Condition required for decimal representation to be terminating.
5. Define irrational number and give an example.
6. What is called 'a quadratic polynomial.
7. Define linear polynomial.
8. What is the meaning of degree of polynomial
9. Define zero of a polynomial.
10. What is the geometric meaning of the zeroes of a polynomial.
11. State the relationship between zeroes and coefficients of a quadratic polynomial.
12. What is the formula connecting Dividend, Divisor, Quotient and Remainder.
13. State division Algorithm for polynomials.
14. How many zeroes can a quadratic polynomial have in general.
15. How many zeroes can a cubic polynomial have.
16. What is the shape of a linear polynomial graph.
17. What is the shape of a quadratic polynomial graph.
18. In general polynomial  $p(x)$  of degree  $n$  crosses the  $x$ -axis at most in how many points.
19. Write Discriminant of a quadratic polynomial.
20. If the value of the Discriminant is greater than zero, the graph of  $p(x) = ax^2 + bx + c$  will intersect the  $x$  – axis at how many points.
21. If the value of the  $D$  (Discriminant) is greater than zero, the graph of  $p(x) = ax^2 + bx + c$  will touch the  $x$ -axis at how many points.

22. At what value of the D(Discriminant) the graph of  $p(x) = ax^2 + bx + c$  will neither touch nor intersect the x-axis
23. What is the algebraic condition for the system of simultaneous pair of linear equations in two variables to have Unique-Solution.
24. What is the algebraic condition for the system of simultaneous pair of linear equations in two variables to have no Solution.
25. What is the algebraic condition for the system of simultaneous of linear equations in two variables to have infinitely many Solution.
26. What is the graphical condition for the system of simultaneous pair of linear equation in two variables to have unique solution.
27. What is the graphical condition for the system of simultaneous pair of linear equations in two variables to have no solution.
28. What is the graphical condition for the system of simultaneous pair of linear equations in two variables to have infinitely many solutions.
29. When will the system of linear equations of two variables are inconsistent
30. When will the system of linear equations of two variables are said to be independent.
31. Under what conditions the system of linear equations of two variables are said to be dependent.
32. When will the system of linear equations of two variables have more than one solution.
33. When will the system of linear equations of two variables have not more than one solution.
34. When will the system of linear equations of two variables have are said to be consistent.
35. When will the system of linear equations of two variables represent coincident lines.
36. What is the condition by which the system of linear equations of two variables has a non-zero solution.
37. What is called a solution of the system of linear equations of two variables.
38. Write the most general form of a pair of linear equations.

## **SIX MARK QUESTIONS**

1. The sum of two numbers is 1000 and difference between their squares is 25600. Find the numbers? (628, 372)
2. Of the two numbers, 4 times the smaller one is less than 3 times the larger one by 5. But the sum of the numbers is larger than 6 times their difference by 6. Find the numbers ? (59, 43)
3. If one added to the numerator of fraction, it becomes  $\frac{1}{2}$ ; and 7 is added to the denominator, the fractions becomes  $\frac{1}{3}$ . Find the fraction. (19/50)
4. If from twice the greater of the numbers, 20 is subtracted, the result is the other number. If from the smaller number, 5 is subtracted the result is the first number. Find the numbers. (15/10)
5. Father is six times as old as his son. Four years hence he will be four times as old as his son will be. Find their present ages. (36 yrs. 6yrs)
6. The present age of a father is equal to the sum of age of his 5 children. 12 years hence the son of ages of his children will be twice the age of their father. Find the present age of father. (36 yrs)
7. One year ago a man 4 times as old as his son in 5 years times his age exceed twice of his sons age by 9 years. Find their present ages?
8. Five years ago a man was thrice as old as his son and 10 years later he shall be twice as old as his son. Find their present ages. (50 yrs, 20 yrs)
9. The sum of the ages inures of son and his father is 35 and the product of the ages is 150. Find their present ages ? (30, 5)
10. A boat goes 30 km upstream and 44 km downstream in 10 hours. It can go 40 Km upstream and 55 km downstream in 13 hours. Find the speed of the boat in still water and that of the steam. (8 km/hour, 3 km hr)

11. A sailor goes 8 km downstream in 40 minutes and returns in 1 hour. Find the speed of the sailor in still water and the speed of the current. (10 km 2km)
12. A man walks a certain distance at a certain speed. Had he walked  $\frac{1}{2}$  km/hour faster, he would have taken 1 hour less. But If he had gone 1 km /hour slower. He would have taken 3 hours more. Find the distance. ( 3 Km/s)
13. The speed of a boat in still water is 10 km/hour. If it can travel 26 km down stream and 14 km upstream in the same time. Find the speed of the stream.
14. A takes 3 hours longer than B to walk 30 km But , if A doubles his pace, he is ahead of B by 1 and  $\frac{1}{2}$  hours. Find their speeds of walking.  
(Speed of A =  $10\frac{1}{3}$  km/hour, and speed of B = 5 km/hour)
15. A man travels 35 km partly at 4 km/ph and partly at 5 km/ph. If he covers the former distance at 5 km/ph and the later distance at 4 km/ph, he could cover 2 km more in the same time. Find the time taken to cover the whole distance at the original rate.
16. The area of the rectangle gets reduced by  $9\text{ m}^2$ . If 5 m and the breadth reduce its length increased by 3 m. If we increase the length by 3 m and breadth by 2m, the area is increased by  $67\text{m}^2$ . Find the dimensions of the rectangle ?  
(B=9, l=17)
17. The length of a room exceeds its breadth by 3m. If the length is increased by 3m and 2m decrease the breadth, the area remains the same. Find the length and breadth. (l = 15, b = 12)
18. The area of the rectangle remains the same if its length is increased by 7 m and 3m decrease the breadth. The area remains unaffected if 5 m increase the length. Find the dimensions of the rectangle.
19. The perimeter of a rectangle is 20m. If the length and the breadth are as 3 : 2 find them ?

20. The area of a rectangle increases by  $200\text{m}^2$ . If the length is increased by 8m and the breadth by 3m. The area increases by  $255\text{m}^2$  if the length is increased by 3m. The area increased by  $255\text{m}^2$  if the length is increased by 3m and the breadth by 8m. Find the length and breadth of the rectangle? ( $l = 24$ ,  $b=13$ )
21. If the length of a given rectangle is increased by 3 m and 4 m reduce breadth, then the area of the rectangle is reduced by  $72\text{ m}^2$ . If we reduce the length by 1 m and increase the breadth by 4 m, then the area is increased by  $88\text{m}^2$ . Find the dimensions of the rectangle.
22. Ahead of B BY  $3\frac{1}{2}$  hours. Find their speeds of walking.
23. A train covered a certain distance at a uniform speed. If the train would have been 6 km/hr. faster, it would have taken 4 hours less than the scheduled time. And if the train were slower by 6 km/hr., it would have taken 6 hours more than the scheduled time. Find the length of the journey.
24. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.
25. On selling a tea set at 5% loss and a lemon set at 15% gain, a crockery seller gains Rs. 7. If he sells the tea set at 5% gain and lemon set at 10% gain he gains Rs. 13. Find the actual price of the set.
26. In an examination paper, one mark is awarded for every correct answer while  $\frac{1}{4}$  mark is deducted for every wrong answer. A student answered 120 questions and got 90 marks. How many questions did he answer correctly?
27. Ratio between the girls and boys in a class of 40 students is 2:3. Five new students joined the class. How many of them must be boys so that the ratio between girls and boys becomes 4 :5?

28. If you travel by an auto rickshaw the fare for the first kilometer is different from the rate per km for the remaining distance. The total fare for a distance of 20 km is Rs. 37.70 and that for a distance of 26 km is Rs. 48.50. Find the auto fare for the first kilometer and for the each successive kilometer.
29. One kilogram of tea and 4 kg of sugar together cost Rs. 220. If the price of sugar increased by 50% and the price of tea increases by 10% the cost would be Rs. 266. Find the original cost per kilogram of each.
30. There are two examination rooms A and B. If 10 candidates are sent from A to B, the number of students in each room is same. If 20 candidates are sent from B to A, the number of students in A is double the number of students in B. Find the number of students in each room.
31. A bag contains 94 coins of 50 paise and 25 paise denominations. If the total worth of these coins were Rs. 29.75. Find the number of coins in each kind.
32. A man wished to give Rs. 12 to each person and found that he fell short of Rs. 6 when he wanted to give to all the persons present. He therefore distributed Rs. 9 to each person and found that Rs. 9 were left over. How much money did he have and how many persons were there ?
33. The expenses of a lunch are partly constant and partly proportional to the number of guests. The expenses amount to Rs. 65 for 7 guests and Rs. 97 for 11 guests. Then the expenses for 18 guests will amount to?
34. The sum total of the ages of father and son is 55 years. If the father was to live till his son's age equals his present age, the total of their ages would be 93. Find their present ages.
35. A number consists of three digits whose sum is 17. The middle one exceeds the sum of the other two by 1. If the digits be reversed, the number is diminished by 396. Find the number.

36. If three times, the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also if sever times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the number.
37. In a parallelogram, one angle is  $\frac{4}{5}^{\text{th}}$  of the adjacent angle. Determine the angle of the parallelogram.
- 38 A man bought 4 horses and 9 cows for Rs. 1340. He sells the horses at a profit of 10% and the cows at a profit of 20% and his whole gain is Rs. 188. What price did pay for the horses?
- 39 The age of a father is equal to the sum of the ages of his 5 children. After 15 years sum of the ages of the children will be twice the age of the father. Find the age of the father.
- 40 The largest angle of a triangle is equal to the sum of the other two angles. The smallest angle is  $\frac{1}{4}$  of the largest angle. Find the angles of the triangle.
- 41 In a pen (a small enclosure) there are rabbits and pheasants (game birds). They have between them 35 heads and 98 feet. How many rabbits are there?
- 42 A car goes uphill at the rate of 30 km an hour and downhill at the rate of 50 km an hour. After 15 hours it has covered a distance of 650 km. How long did it go downhill and uphill respectively?

- 43 A man when asked how many hens and buffaloes he has told that his animals have 120 eyes and 180 legs. How many hens and buffaloes has he?
- 44 Ten years ago, the sum of the ages of two sons was one third of their father's age. One son is two years older than the other and the sum of their present ages is 14 years less than the father's present age. Find the present ages of all.
- 45 If twice the son's age in years is added to the father's age, the sum is 70. But if twice the father's age is added to the son's age, the sum is 95. Find the ages of father and son.
- 46 A fraction reduces to  $\frac{1}{4}$  when 2 is subtracted from the numerator and 3 is added to denominator. But it reduces to  $\frac{2}{3}$  if 6 is added to the numerator and the denominator is multiplied by 3, find the fraction.
- 47 The sum of a two digit number and the number obtained by reversing the order of its digits is 121 and the two digits differ by 3. Find the number.
48. A railway half ticket costs half the full fare and the reservation charge is the same on half ticket as on full ticket. One reserved first class ticket from Bombay to Ahmedabad costs Rs. 216 and one full and one half reserved first class tickets cost Rs. 327. What is the basic first class full fare and what is the reservation charge ?

# PRACTICE PAPER

X Std

practice paper

subject : Mathematics

① If  $\tan \theta = \sqrt{2}$ , find the value of  $\frac{\sec^2 \theta - \operatorname{cosec}^2 \theta}{\sec^2 \theta + \operatorname{cosec}^2 \theta}$

② If  $\frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta} = \frac{3}{5}$  find  $\tan \theta$

③ If  $4 \sin \theta - 3 \cos \theta = 0$  show that  $\sec \theta = \frac{5}{4}$

④ If  $\frac{1 + \cos \theta}{1 - \cos \theta} = \frac{\sqrt{2} + 1}{\sqrt{2} - 1}$  show that  $\sin 2\theta = 1$

⑤ If  $2 \sin A = 1$  and  $2 \cos B = 1$ , find the value of  $\sin(A+B)$

⑥ Show that  $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ = 1$

⑦ Prove that  $\sin(20^\circ + \theta) \cos(70^\circ - \theta) + \cos(20^\circ + \theta) \sin(70^\circ - \theta) = 1$

⑧ Find the value of  $\sin^2 10^\circ + \sin^2 30^\circ + \sin^2 60^\circ + \sin^2 80^\circ$

Solve the following equations:-

①  $\frac{1 + \sin \theta}{1 - \sin \theta} = \frac{3}{1}$

②  $\cos^2 x - \sin x = \frac{1}{4}$

③  $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta} = \frac{1 + \sqrt{3}}{1 - \sqrt{3}}$

④  $\tan 3\theta = \cot(30^\circ + \theta)$

⑤  $\sin \theta = \cos(20^\circ + \theta)$

⑥  $5 - 7 \sin \theta - 2 \cos^2 \theta = 0$

⑦  $\sec^2 \theta = 2 \tan \theta$

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Q) If  $\tan 22^\circ = 0.40$ , find the value of  $\tan 68^\circ$

(10) If  $2 \sin \theta - 1 = 0$ , show that  $\sec \theta + \tan \theta = \sqrt{3}$

Prove the following Identi.

$$\textcircled{1} (\cos^2 \theta - 1)(\cot^2 \theta + 1) + 1 = 0$$

$$\textcircled{2} \sin^4 \theta + \cos^4 \theta = 1 - 2 \sin^2 \theta \cos^2 \theta \quad \dots$$

$$(3) \frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \tan \theta + \sec \theta$$

$$(4) \frac{1}{\sec \theta - \tan \theta} - \frac{1}{\cos \theta} = \tan \theta$$

Sec  $\theta = \tan \theta$

⑤ If  $x = a \sin \theta$ ,  $y = b \tan \theta$  prove that  $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 1$

⑥ If  $x = a \sin \theta + b \tan \theta$  and  $y = a \tan \theta + b \sec \theta$ , prove that  $x^2 - y^2 = a^2 - b^2$

$$(7) \tan(45 - A) \times \tan(45 + A) = 1$$

(8)  $\tan^2 A \sec^2 B - \sec^2 A \tan^2 B = \tan^2 A - \tan^2 B$

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