MATHEMATICS

CLASS X

Time 21/2 hrs.
70 Marks.

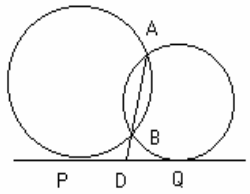
1. For what value of K, the following system of equation have infinite solutions?
   $2x + ky = 1$; $3x – 5y = 7$.
2. Solve the following system of linear Equation
   $(a - b)x + (a + b)y = a^2 - 2ab – b^2$; $(a + b)(x + y) = a^2 + b^2$
3. The age of father is 3 years more than 3 times the son's age. 3 years hence the age of the father will be 10 years
   more than twice the age of the son. Find their present age.
4. Two places A & B are 120 km apart from each other on a highway. A car starts from A and another from B at the same time. If they move in the same direction, they meet in 6 hours, and if they move in opposite directions, they meet in 1 hr 12 min. find the speed of each car.
5. Find the value of a and b such that the polynomial $P(x)= (x^2 + 3x + 2)(x^2 + 2x + a)$ and $Q(x)= (x^2 + 7x + 12)(x^2 + 7x + b)$ have $(x + 1)(x + 3)$ as their HCF.
6. Two numbers differ by 3 and their product is 504 Find the no.

OR

Solve: $\frac{X}{X+1} + \frac{X+1}{X} = \frac{34}{15}$, X is not equal to -1 and 0

7. A passenger train takes 3 hours less for a journey of 360 km if its speed is increased by 10 kmph. What is the usual speed? **OR** Find the values of K for which the equation x2 + 5k + 16 =0 has no real root.
8. If 10 times the 10^{th} term of an AP is equal to 15 times its 15^{th} term, show that its 25^{th} term is zero.
9. Find the sum of all the odd numbers between 100 and 200. **OR** find the sum of all 2digit whole no.divisible by 3.
10. An article is sold for Rs. 500 cash or for Rs. 150 cash down payment followed by 3 equal monthly installments. If the rate is 15% pa. Find the monthly installment.
11. Ravi borrowed Rs. 7950 at 12% p.a. compounded annam. If he pays it back into equal 3 annually installment calculate the value of each installment.
12. Mrs. Monika is an income tax officer. Her income from her salary during the year is 2,06,953. She contributes Rs.20,695 to her provident fund and pays Rs. 10821 as LIC premium. She has paid Rs. 15900 as advance tax.
13. The angle of elevation of a jet plane from a point A on the ground is 60^0. After a flight of 15 sec. the angle of elevation changes to 30^0. If the jet plane is flying at a constant height of 2000root 3m. Find the speed of the jet.
14. A solid toy is in the form of a right circular cylinder with a hemispherical shaped at one end and a cone at the other end. Their common diameter is 4.2 cm, and the height of the cylinder and conical portion are 12cm and 7 cm. rep. Find the volume of the given toy. **OR** A semi-circular thin sheet of metal of diameters 28 cm is bent and an open conical cup is made. Find the capacity of the cup.
15. The external diameter and internal diameters of hollow hemispherical vessel are 10 cm and 8 cm . find the volume and T S A of vessel. **OR** Find the volume and total surface area of frustum of cone it the diameters of the ends are 3.5 and 6.5 cm and Perpendicular height of the frustum 7.8 cm
16. Prove that the opposite angles of cyclic Q^{udr}. are supplementary

17. If PAB is a secant to a circle intersecting the circle at A and B and PT is a tangent to the circle at T then prove that PT2 = PA . PB Using above result Prove DP = DQ



18. Determine the ration in which the line $3x + y - 9 = 0$ divides the segment joining the pt (1,3) and (2,7) OR If the pt A(-2,-1) B(1,0) C(x,3) and D(1,y) find the value of x and y //^{gm}

19. Find the missing frequencies in the following distribution table, it is given that mean of the distribution is 56

Class	0-20	20-40	40-60	60-80	80-100	100-120	Total
Freq.	16	Fi	25	F2	12	10	90