

General Instructions : Q. No. 1 to 10 carries 3 marks each.  
 Q. No. 11 to 20 carries 4 marks each.  
 Q. No. 21 to 25 carries 6 marks each.

1. Solve for x and y ,  $x + 3y = -7$  and  $3x - y = 19$
2. The sum of the digits of a two-digit number is 8. The number obtained by interchanging the two digits exceeds the given number by 36. Find the number.
3. Find the HCF and LCM of  $4(x^2 - 4)(x+7)$  and  $(x+2)(x^2 - 49)$
4. The 8th term of an Arithmetic Progression is 37 and its 12th term is 57. Find the A.P.
5. In the figure, AB is a diameter of a circle, with centre O. If angle ABC = 70°, angle CAD = 30° and angle BAE = 60°, find angle BAC, angle ACD and angle ABE.
6. A builder sales of flats for Rs.30,00,000 cash or for Rs.10,31,600 cash down payment and three equal quarterly instalments. If the rate of interest charged is 10% per annum compounded quarterly., compute the value of each instalment under instalment scheme. Also, find the total interest.
7. A wrist watch is available for Rs.960 cash or for Rs. 480 cash down payment and two equal monthly instalments of Rs. 245 each. Calculate the rate of interest charged under the instalment plan.
8. If ABC is an equilateral triangle of side 2a prove that the altitude  $AD = 3a$  and  $3AB^2 = 4AD^2$ .
9. Prove that the area of the equilateral triangle described on the side of a square is half the area of the equilateral triangle described on its diagonal.
10. If  $(x-3)$  is a factor of  $2x^2 + ax + b$  and  $a+b=2$ , find the values of a and b.  
 OR  
 The sum of first 7 terms of an A.P. is 10 and that of next 7 terms is. Find the A.P.
11. The radius and height of a right circular cone are in the ratio of 3:4. If its volume is 301.44 cu.cm. find its radius and the slant height.  
 OR  
 The surface area of sphere is  $452 \frac{4}{7}$  sq.cm. what is its volume?
12. solve the following system of equations graphically,  
 $x+y=7$  ,  $5x+2y=20$
13. Without using tables, evaluate,  
 $\cos(40^\circ + A) - \sin(50^\circ - A) + \cos^2 40^\circ + \cos^2 50^\circ + \tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ$
14. Find the ratio in which the line-segment joining the points (6,4) and (1,-7) is divided internally by the axis of x.
15. Solve
16. If the distances of P(x,y) from A(a+b, b-a) and B(a-b, a+b) are equal prove that  $bx=ay$ .
17. Calculate the mean of the following frequency distribution
- C.I. 0-80 80-160 160-240 240-320 320-400  
 Freq. 22 35 44 25 24
18. The number of students in a hostel speaking different languages is given below.  
 present the data in a pie-chart.  
 Language Hindi English Marathi Tamil Bengali Total

No. 40 12 9 7 4 72

19. A bag contains 3 red balls, 5 black balls and 4 white balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is :  
 a) white? b) red? c) black?
20. Construct a triangle ABC in which AB = 6cm, AC = 5.5cm. and angle A = 60. Draw the circumcircle of the triangle ABC and measure its radius.
21. An aeroplane when flying at a height of 4000 m from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two aeroplanes from the same point on the ground are 60 and 45 respectively. Find the vertical distance between the two aeroplanes at that instant.
- OR The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60. At a point Y, 40m vertically above X, the angle of elevation is 45. Find the height of the tower PQ and the distance XQ.
22. Prove that in a triangle, if a line drawn parallel to one side of a triangle, to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

Using the above, prove the following,  
 If  $DE \parallel AC$  and  $DC \parallel AP$  prove that  
 $\frac{BE}{EC} = \frac{BC}{CP}$

23. The sum of the either pair of the opposite angles of a cyclic quadrilateral is 180. Prove.  
 Using the above result to find out the value of x and y from the figure.

24. A toy is in the form of a cone mounted on a hemisphere of diameter 7 cm. The total height of the toy is 14.5 cm. Find the volume and the total surface area of the toy.

25. Rajan has a total annual income of Rs.1,42,000, excluding HRA. He pays an annual premium of Rs.2500 for his LIC policy, invests Rs.20,000 in NSC and contributes Rs.1,000 per month to his provident fund. Calculate his annual tax liability.

Standard Deduction

1/3rd of the total annual gross salary subject to maximum of Rs. 30,000 if income is less than Rs.1.5 lakh and Rs. 25,000 if income is from Rs.1.5 lakh to Rs. 3 lakh.

Rate of Income Tax.

- i) Upto Rs. 50,000 Nil
- ii) From Rs.50,001 to Rs.60,000 10% of the amount exceeding Rs. 50,000
- iii) From Rs. 60,001 to Rs. 1,50,000 Rs.1000+ 20% of the amt. exceeding Rs.60,000.
- iv) Above Rs. 1,50,000 Rs. 19,000 + 30% of the amount exceeding Rs1,50,000

Rebate : 20% of the amount of saving subject to maximum Rs.14,000 if taxable income is upto Rs.1,50,000

15% of the amount of saving  
subject to a maximum of  
Rs.10,500 if taxable income is  
above Rs. 1,50,000.

Surcharge :

5% of the net income tax paid.