CLASS : X **SUB : MATHS**

1. Find the edge of cube, if volume of the cube is equal to the volume of cuboid of dimensions 8m x 4m x 2m .
2. How many terms of A.P. -10, -7, -4, -1, ... must be added to get the sum 104?
3. A washing machine is available at Rs. 9,600 cash or for Rs. 2,100 cash down payment followed by five monthly instalments of Rs. 1,5,45 each. Find the rate of interest charged under the instalment plan.
4. A person borrowed some money on compound interest and returned in 3 years in equal annual instalments. If the rate of interest is 15% p.a. compounded annually and annual instalment is Rs. 4,86,680, find the sum borrowed.
5. In triangle ABC DE//BC and AD : DB = 2:3. Determina Area triangle ADE : Area triangle ABC.
6. Qudrilateral PQRS is a cyclic. PQ and RQ are chords of a circle equidistant from the centre O. Prove that diameter QS bisects angle PQ and angle PSR.
   OR TA and TB are tangent segments to a circle from an external point T. If OT intersects the circle in P, prove that AP bisects angle TAB.
7. If the mean of the following data is 21.5, find the value of k :

Xi	5	15	25	35	45
fi	6	4	3	k	2

8. A pair of dice is thrown once. Find the probability of getting a sum of 11.
9. A well 14m deep is 2m in radius. Find the cost of cementing the inner curved surface at the rate of Rs.2 per square metre.

OR A vessel is in the form of a hemi-spherical bowl mounted by a hollow cylinder. The diameter of the sphere is 14 cm and the total height of the vessel is 13 cm. Find the capacity.
(pi = 22/7)

10. A granary is in the shape of a cuboid of size 8m x 6m x 3m. If a bag of grain occupies a space of 0.65 cu.m how many bags can be stored in the granary?
11. Solve the following system of linear equations graphically :
    2x + y = 8 and 3x - 2y = 12. From the graph, read the points where the lines meet the x-axis.
12. From which rational expression should $2x^2 + 2x - 7$ be substracted to get additive inverse $x^2 + x - 6$
    of $x - 1$
    $x - 2$
13. The GCD of two polynomials is (x+3) and their LCM is $x^3 - 7x + 6$. If one of the polynomials is $(x^2 + 2x - 3)$, find the other.
14. One fourth of a herd of camels were seen in the forest. Twice the square root of the herd had gone to mountains and the remaining 15 camels were seen on the bank of a river. Find the total number of camels?
15. Construct a pair of a tangents from a point 5 cm away from the centre of a circle of radius 2 cm and measure their lengths.
16. Prove that $(1 + \cot A + \tan A)(\sin A - \cos A) = \sin^2 A \cos^2 A$
    $\sec^3 A - \operatorname{cosec}^3 A$
17. Using distance formula, prove that the points (-3, 2) , (1, -2) and (9, -10) are collinear.
18. The length of a line segment AB is 10 units. If the point A is (2, -3) and point B is (10, y), find the value(s) of y.
19. Find the point which divides the line segment joining the points (-3, -4) and (-8, 7) in the ratio of 7:5.
20. The surface areas of sphere and a cube are equal. Prove that their volumes are in the ratio 1: pi/6
21. The expenditure of a Nursing Home on various heads is given below :

Heads	Medicines	Food	Doctor	Nurses	Miscellaneous

Expend. 20,000 15,000 10,000 5,000 10,000

Represent the data by a pie chart.

22. the height of a tower is half the height of the flagstaff on it. The angle of elevation of the top of the tower as seen from a point on the ground is 30. Find the angle elevation of the top of the flagstaff as seen from the same point.

23. If a line is drawn parallel to one side of a triangle, prove that the other two sides are divided in the same ratio.

Use the above theorem to calculate AE when in triangle, DE is drawn parallel to side BC. such that AD/DB = 3/5 and AC = 4.8 cm.

24. The degree measure of an arc of a circle is twice the angle subtended by it at any point of alternate segment of a circle with respect to the arc - Prove. Using the above theorem, find the value of x in the given figure if O is the centre of the circle.

25. Assume the following instructions for calculating income tax,

Standard deductions :

a) Upto Rs. 75,000	40% of the salary or Rs. 30,000 whichever is less.
b) From Rs. 75,001 to Rs. 5,00,000	Rs. 30,000
c) Above Rs. 5,00,000	Rs. 20,000

Rates of income tax : When taxable income exceeds Rs. 1,00,000

a) Upto Rs. 50,000	No tax.
b) From Rs. 50,001 to Rs. 60,000	10% of the amount exceeding Rs. 50,000
c) From Rs. 60,001 to Rs. 1,50,000	Rs. 1000 + 20% of the amount by which taxable income exceeds Rs. 60,000
d)From Rs. 1,50,000 to Rs. 8,50,000	Rs. 19,000 + 30% of the amount by which taxable income exceeds Rs. 1,50,000

Rebate in Tax :

a) 20% of the savings subject to a maximum of Rs. 14,000 if the gross income is upto Rs. 1,50,000.

b) 15% of the savings subject to a maximum of Rs. 10,500 if the gross income is between Rs. 1,50,001 and Rs. 5,00,000

Education Cess : 2% on payable tax.

Surcharge : 10% of the amount if the taxable income exceeds Rs. 8,50,000. The total annual income of Mahesh excluding HRA is Rs. 4,80,000. He is a senior citizen. He has invested Rs. 42,000 in National Saving Certificates and pays Rs. 15,000 towards life insurance policy premium. he donated Rs. 15,000 to the National Foundation for Communal Harmony (100% exemption) and Rs.5,000 to the Rajiv Gandhi Foundation (50% exemption). Calculate the tax liability of Mahesh for the financial year.