CBSE SAMPLE PAPER

SECOND PRE-BOARD EXAMIANTION

CLASS - X MATHEMATICS

[Time: 3hrs.]   [M. M.: 80]

General Instructions:
- (1) All questions are compulsory.
- (2) The question paper consists of 30 quesitons divided into 4 sections.
- (3) Section A comprises of 10 questions of 1 mark each.
  Section B Comprises of 5 questions of 2 marks each.
  Section C comprises of 10 questions of 3 marks each.
  Section d comprises of 5 questions of 6 marks each.
- (4) There is no overall choice. However internal choice has been provided in 1 question of 2 marks, 3 questions of 3 marks each and 2 questions of 6 marks each.
- (5) In questions of construction, drawing should be neat and exactly as per the given requirement

SECTION – A

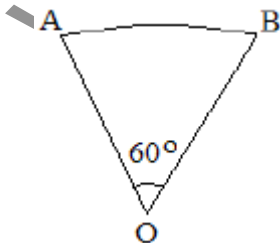Q1. If sec θ= $\frac{5}{4}$, then find the value of $\frac{\tan \theta}{1+\tan^2 \theta}$.

Q2. State the Fundamental theorem of Arithmetic.

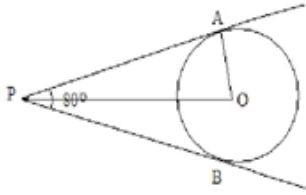Q3. The sum and product of the zeroes of a quadratic polynomial are $-1/3$ and -2 respectively.
     What is the quadratic polynomial?

Q4. If the adjoining figure is a sector of a circle of radius 10.5 cm, find the perimeter of the sector.
     (Take π = ^{22} /7)

Q5. In the adjoining figure, PA and PB are tangents from a point P to a circle with centre O and are inclined at an angle of 80°. Find ∠ POA.


Q6. Give an example of
polynomials f(x), g(x), q(x)
and r(x) satisfying f(x) =
g(x). q(x) + r(x)
where degree of r(x) = 0

Q7. Write the empirical relationship between the three measures of central tendency.

Q8. Which term of the AP
121, 117, 113................. is its first negative term?

Q9. A vertical pole of length 6m casts a shadow 4m long on the ground and at the same time a tower casts a shadow 28m long. Find the height of the tower.

Q10. A student draws a cumulative frequency curve for the marks obtained by 60 students of a class as shown below. Find the median class marks obtained by the students of the class.
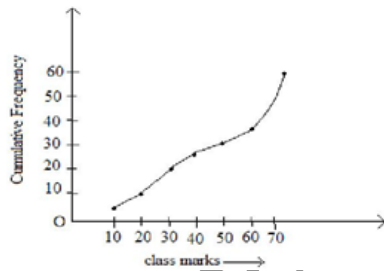
SECTION – B

Q11. Find the solution for the pare of equations:
$\frac{3}{x} + \frac{8}{y} = 1, \frac{1}{x} - \frac{3}{y} = 2$, x,y≠ 0

Q12. Find the sum of first 51 terms of an AP whose second and third terms are 14 and 18 respectively.

Q13. Check whether (-2, 5), (3, -4) and (7, 10) are the vertices of an isosceles right triangle.

Q14. Evaluate:

$$\frac{5 \cos^2 60^o + 4 \sec^2 30^o - \tan^2 45^o}{\sin^2 30^o + \cos^2 30^o}$$

Q15. ABCD is a trapezium in which AB||DC and its diagonals intersect each other at the point O.

show that

$$\frac{AO}{BO} = \frac{CO}{DO}$$

OR

Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle$ PTQ = 2 $\angle$ OPQ

SECTION – C

Q16. Find all the zeroes of

$2x^4 - 3x^3 - 3x^2 + 5x - 2$, if two of its zeroes are and $\sqrt{2}$ and $-\sqrt{2}$.

Q17. Find HCF and LCM of 336 and 54 by prime factorization and verify that HCF×LCM = product of the two numbers.

OR

Show that any positive add integer is of the form 6q + 1, or 6q + 3 or 6q + 5, where q is some integer.

Q18. A jar contains 24 marbles, some green and other blue. If a marble is drawn at random from the jar, the probability that it is green is 2/3 .Find the number of blue marbles in the jar.

Q19. Prove that
(cosec A – sin A)(sec A – cos A) =

$$\frac{1}{\tan A + \cot A}$$

OR

Evaluate $\dfrac{\cos 70^o}{\sin 20^o} + \dfrac{\cos 55^o \cos ec35^o}{\tan 5^o \ \tan 25^o \ \tan 45^o \ \tan 65^o \ \tan 85^o}$

Q20. A motorboat whose speed is 18km/hr in still water takes 1 hour more to go 24km upstream than to return downstream to the same point. Find the speed of the steam.

Q21. If points A and B are (-2, -2) and (2, -4) respectively, fin the coordinates fob P such that AP = $\frac{3}{7}$ AB and P lies on the line segment AB.

Q22. The three vertices of a triangle are (-5, -1), (3, k), (5, 2). Find the K if area of a triangle is 32 square units.

Q23. Construct a triangle ABC with side BC = 7cm, $\angle$ B = 45⁰, C = $\angle$ 30⁰. Then construct a triangle

whose sides are 4/3 times the corresponding sides for triangle ABC.

Q24. Find the area of a shaded region in the given figure where. AB and CD are diameters of a circle with center O perpendicular to each other and OD is the diameter of the smaller circle such that OA = 7cm.
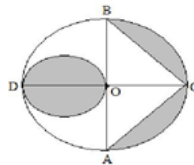
OR

A well of diameter 3m is dug 14m deep. The earth taken out of it has been spread evenly all around it in the shape of circular ring of width 4m to form an embankment. Find the height of the embankment.

Q25. In an equilateral triangle ABC, D is s point on sides BC such that BD =1/3BC. Prove that $9AD^2 = 7AB^2$.

SECITON – D

Q26. Solve the following system of linear equations graphically:

3x – 4y + 6 = 0

3x + y – 9 = 0

Shade the region bounded by these lines and the x – axis.

Also find the ratio of areas of triangles formed by given liens with x – axis and y – axis.

Q27. The shadow of a vertical tower standing on a level increases by 40 meters, when the altitude of the sun changes from angle of elevation 60o to 30o. Find the height of the tower.

OR

The angles of elevation of the top of a tower from two points at distance a and b meters form the base and in the same straight line with it are complementary.

Prove that the base and of the tower is $\sqrt{ab}$ meters.

Q28. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

In given figure. PB and QA are perpendicular to segment AB such that PO = 5cm, QO = 7cm and area (ΔPOB) = 150cm², using above theorem, find the area of triangle QOA.
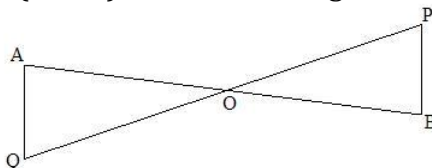
Q29. An open metallic bucket is in the shape of a frustum of a cone mounted on hollow cylindrical base made of metallic sheet. If the diameters of the two circular ends of the bucket are 45cm and 25cm, the total vertical height of the bucket is 30cm and that of the cylindrical portions is 6cm.

find the area of metallic sheet used to make the bucket. Also find the volume of the water it can hold.

<div align="center">OR</div>

A solid is in the form for cylinder with hemispherical ends. The total of the solid is 108cm and the diameter of the hemispherical ends is 36cm. find the cost of polishing the surface of the solid at there rate of 7 paise per sq.cm.

Q30. The following table shows s the marcs obtained by 100 students of class X in a school during a particular academic session. Find the mode of theis distribution.

Marks	No. of students
Less than 10	7
Less than 20	21
Less than 30	34
Less than 40	46
Less than 50	66
Less than 60	77
Less than 70	92
Less than 80	100