BOARD QUESTION PAPER : MARCH 2018

GEOMETRY

Time: 2 Hours **Max. Marks: 40**

Note:

i. Solve *all* questions. Draw diagrams wherever necessary.
ii. Use of calculator is not allowed.
iii. Figures to the right indicate full marks.
iv. Marks of constructions should be distinct. They should not be rubbed off.
v. Diagram is essential for writing the proof of the theorem.

Q.P. SET CODE
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1. Attempt any *five* sub-questions from the following : **[5]**

i. Δ DEF ~ Δ MNK. If DE = 5 and MN = 6, then find the value of $\frac{A(\Delta DEF)}{A(\Delta MNK)}$.

ii. If two circles with radii 8 cm and 3 cm respectively touch externally, then find the distance between their centres.

iii. Find the length of the altitude of an equilateral triangle with side 6 cm.

iv. If $\theta = 45°$, then find tan θ.

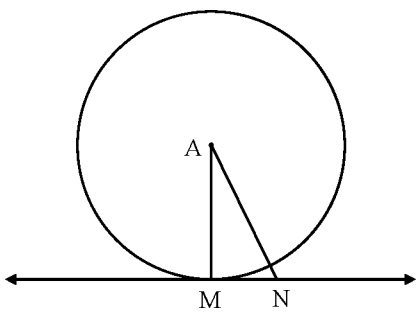
v. Slope of a line is 3 and y intercept is –4. Write the equation of a line.

vi. Using Euler's formula, find V, if E = 30, F = 12.

2. Attempt any *four* sub-questions from the following : **[8]**

i. The ratio of the areas of two triangles with common base is 4:3. Height of the larger triangle is 6 cm, then find the corresponding height of the smaller triangle.

ii. In the following figure, point 'A' is the centre of the circle. Line MN is tangent at point M. If AN = 12 cm and MN = 6 cm, determine the radius of the circle.



iii. Draw $\angle$PQR of measure 70° and bisect it.

iv. If $\cos\theta = \frac{3}{5}$, where 'θ' is an acute angle. Find the value of sin θ.

v. The volume of a cube is 1000 cm^3. Find its side.

vi. The radius and slant height of a cone are 4 cm and 25 cm respectively. Find the curved surface area of that cone. ($\pi = 3.14$)

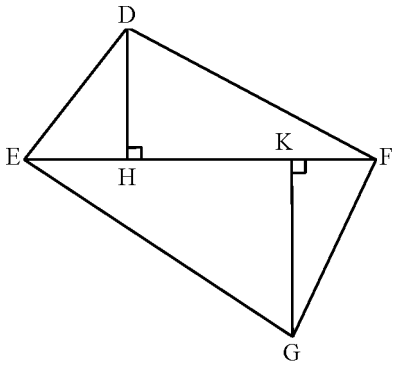
3. Attempt any *three* sub-questions from the following : **[9]**

i. In the following figure, seg DH $\perp$ seg EF and seg GK $\perp$ seg EF. If DH = 6 cm, GK = 10 cm and A(Δ DEF) = 150 cm^2, then find :

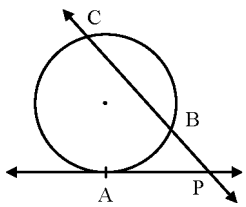
i. EF

ii. A(Δ GEF)

iii. A($\square$ DFGE).



ii. In the following figure, ray PA is the tangent to the circle at point A and PBC is a secant. If AP = 14, BP = 10, then find BC.



iii. Draw the circle with centre C and radius 3.6 cm. Take point B which is at distance 7.2 cm from the centre. Draw tangents to the circle from point B.

iv. Show that: $\sqrt{\frac{1-\sin x}{1+\sin x}} = \sec x - \tan x$.

v. Write the equation of the line passing through points C(4, –5) and D(–1, –2) in the form of $ax + by + c = 0$.

4. Attempt any *two* sub-questions from the following : **[8]**

i. Prove that, "the lengths of the two tangent segments to a circle drawn from an external point are equal".

ii. A tree is broken by the wind. The top of that tree struck the ground at an angle of 30° and at a distance of 30 m from the root. Find the height of the whole tree. ($\sqrt{3} = 1.73$)

iii. A(5, 4), B(–3, –2) and C(1,–8) are the vertices of a triangle ABC. Find the equation of median AD.

5. Attempt any *two* sub-questions from the following : **[10]**

i. Prove that, in a right-angled triangle, the square of hypotenuse is equal to the sum of the square of remaining two sides.

ii. Δ SHR ~ Δ SVU, in Δ SHR, SH = 4.5 cm, HR = 5.2 cm, SR = 5.8 cm and $\frac{SH}{SV} = \frac{3}{5}$. Construct Δ SVU.

iii. If 'V' is the volume of a cuboid of dimensions $a \times b \times c$ and 'S' is its surface area, then prove that:

$$\frac{1}{V} = \frac{2}{S}\left[\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right].$$