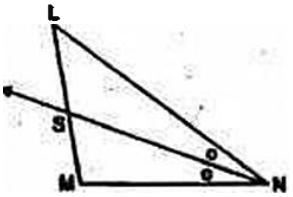
GEOMETRY

Time Duration: 2 Hrs 30 Mins **Question Paper : October 2011** **Maximum Marks:60**

Note : Please Refer to All Notes Q. P. March 2008.

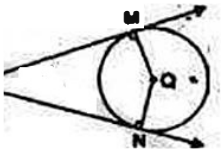
Q.1. (A) Solve any six sub-question :

(i) In the following figure, Ray NS is bisector of ∠LNM In Δ LMN . LS = 4, SM = 2, MN = 8 Find ∠N.

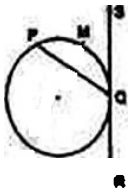


(ii) Find the diagonal of a rectangle whose sides are 4 cm and 3 cm.

(iii) In the following given figure, Q is a centre of the circle and PM, PN are tangent segments to circle. If ∠MPN = 30°, find ∠MQN



(iv) In the following figure, m (arc PMQ) = 120°. Find M PQS.



(v) Draw a line segment of AB = 5.5 cm and bisect it.

(vi) Find the value of $\frac{\tan 52}{\cot 38}$.

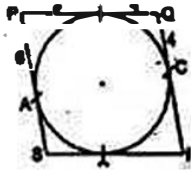
(vii) What is the volume of a cylinder with radius 14 cm and height 2 cm ? (*Given* $\pi = \frac{22}{7}$)

(viii) Find the distance between the points : P (2,6), Q (4, 7).

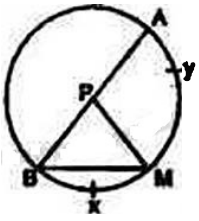
Q. 2. (A) Solve any four sub-questions : **(12)**

(i) In Δ RST. ∠S = 90°, ∠T = 30°, RT = 10, find RS and ST.

(ii) In the following given figure, there are four tangents to a circle at the points A, B, C and D. These four tangents form a parallelogram PQRS. If PB = 6 and BQ = 4, then find PS.



(iii) In the following figure, P is the centre of the circle having diameter AB and M is a Point on the circle. If m ∠PMB = 50°, then find :
(1) m (arc MxB)
(2) m (arc AyM).



(iv) Draw the circumcircle of Δ ABC such that ∠B = 90°, BC = 5.4 cm and AB = 6 cm.

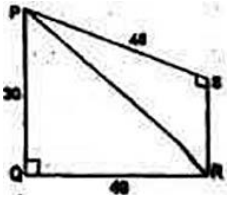
(v) If $\tan\theta = \frac{12}{5}$, then find the values of $\sin\theta$ and $\cos\theta$.

(vi) The volume of a cube is 125 cm^3. Find the total surface area of that cube.

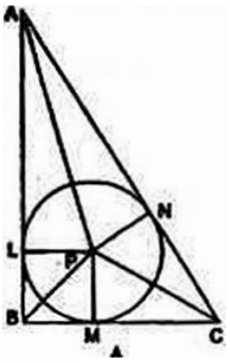
Q. 3. Solve any four sub-questions : **(12)**

(i) Δ ABC ~ Δ PQR, A(Δ ABC) = 144 cm^2 and A(Δ PQR) = 81 cm^2. If AB = 8cm, then find PQ.

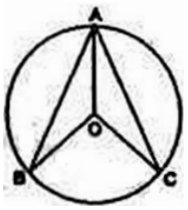
(ii) From the information given below In the figure,
∠PQR - 90°, ∠PSR = 90°,
find : (1) PR and (2) RS



(ii) In the figure given below the inscribed circle of Δ ABC touches, side AB at L, side BC at M and side AC at N.
Prove that A (Δ ABC) = $\frac{1}{2}$ (Perimeter of Δ ABC) × (Radius of the inscribed circle).



(iv) In the figure A, B and C are three points on a circle with centre O such that:
m ∠AOB = 100°, m ∠AOC = 130°
Find m ∠ BAC.



(v) From the top of a lighthouse, an observer looks at a ship and finds the angle of depression to be 60°. If the height of the lighthouse is 90 metres, then find how far is that ship from the lighthouse ?

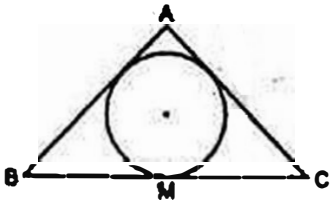
(vi) Using distance formula, show that the points L (-1,6), M (1, 5) and N (-5, 8) are collinear.

Q. 4. Solve any three sub-questions : **(12)**

(i) Prove that, in a triangle, the angle bisector divides the side opposite to the angle in the ratio of remaining sides.

(ii) In Δ ABC, seg AP is a median. If AP = 7 and $AB^2 + AC^2 = 260$, then find BC.

(iii) In the given figure below, the circle is the incircle of an isosceles Δ ABC, where seg AB ≅ seg AC. Prove that M bisects BC.



(iv) O is the centre of a circle. Point M, in arc AMB is such that :
m (arc AM) = m (arc MB).
Show that readius OM is perpendicular to chord AB.

(v) Draw a tangent to a circle with centre P and radius 2.8 cm, from a point 'M' such that PM = 7 cm.

(vi) 5 rupee coins were made by melting a solid cuboidal block of metal with dimensions 16 × 11 × 10 in cm. How many coins of thickness 2 mm and diameter 2 cm be made ?

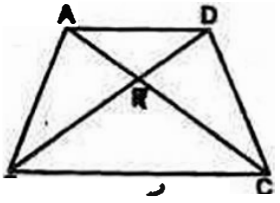
$(Given\ \pi = \frac{22}{7})$

Q. 5. Solve any three sub-questions : **(12)**

(i) Construct Δ ABC, such that AC = 9 cm, ∠B = 90° and altitude BD has length 4 cm.

(ii) Show that :
$\sec^2 A - \operatorname{cosec}^2 A = \frac{2\sin^2 A - 1}{\sin^2 A \cdot \cos^2 A}$

(iii) In □ABCD, side BC || AD. Diagonals AC and BD intersect each other at P.
If AP = $\frac{1}{3}$ AC, then prove that DP = $\frac{1}{2}$ BP.



(iv) An tin-maker converts a cubical metallic box into 10 cylindrical tins. Side of the cube is 50 cm and radius of the cylinder is 7 cm. Find the height of each cylinder so made if the wastage of 12% is incurred in the process. $(Given\ \pi = \frac{22}{7})$

(v) The line segment AB is divided at P = (4,5) internally in the ratio 3 : 4, if B (8, 9) find the coordinates of A.

(vi) In a cyclic quadrilateral show that the sum of the product of the opposite sides is equal to the product of the diagonals.