

SECOND WEEKLY TEST 2014-15

CLASS XII
MATHEMATICS

MM: 30

Time: 50 Min

General Instructions:

1. All questions are compulsory.
 2. Devote appropriate time to each question.
 3. Q 1- 6(Section A) each carries 4 marks and Q10 (Section B) carries 6 marks.
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SECTION A

Q1. Find $\frac{dy}{dx}$ if $y = x^{\cot x} + (\sin x)^{\log x}$.

Q2. If $x = a \left(\cos t + \log \tan \frac{t}{2} \right)$, $y = a \sin t$, find $\frac{d^2y}{dx^2}$ at $t = \frac{\pi}{4}$.

Q3. If $y = e^x (\sin x + \cos x)$, prove that $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 0$.

Q4. Find the intervals on which the function $[x(x-2)]^2$ is:

- (i) Increasing (ii) Decreasing

Q5. Find the equation of the tangent to the curve $y = \sqrt{3x-2}$ which is parallel to the line $4x - 2y + 5 = 0$

Q6. A ladder 5 m long is leaning against a wall. The bottom of the ladder is pulled along the ground, away from the wall, at the rate of 2m/s. How fast is its height on the wall decreasing when the foot of the ladder is 4 m away from the wall ?

OR

Using differentials, find the approximate value of $(32.15)^{1/5}$ up to 2 places of decimal.

SECTION - B

Q7. A wire of length 28 m is to be cut into two pieces. One of the pieces is to be made into a square and the other into a circle. What should be the length of the two pieces so that the combined area of the square and the circle is minimum?

OR

Show that the altitude of the right circular cone of maximum volume that can be inscribed in a sphere

of radius r is $\frac{4r}{3}$.