Sample Question for Class - 7

1. If $x + \dfrac{1}{x} = 1$ and $p = x^{4000} + \dfrac{1}{x^{4000}}$ and q be the digit at units place in the number $2^{2^n} + 1$, n being a natural number greater than 1, then $p + q =$
   (a) 2   (b) 4   (c) 6   (d) None of these

2. Sum of all the real roots of the equation $|x - 2|^2 + |x - 2| - 2 = 0$ is .....
   (a) 0   (b) -4 (c) 4   (d) 2

3. Find all the values of p for which one root of the equation $x^2 - (p+1)x + p^2 + p - 8 = 0$ is greater than 2 and of the other root is smaller than 2.
   (a) $-2 < p < 3$
   (b) $-3 < p < 2$
   (c) $-3 < p$
   (d) $p < 2$

4. x, y and z are three angles of a triangle. Which of the following set of values of x, y and z satisfies $\log(x \times y \times z) = 3\log X + 4\log 2$, given that x, y and z are integers?
   (a) $30^0, 70^0, 80^0$ (b) $30^0, 60^0, 90^0$ (c) $20^0, 80^0, 80^0$ (d) $30^0, 50^0, 100^0$

5. Distance between Lucknow and Patna is 300 km. Mayank leaves at a speed of x km/h from Lucknow towards Patna. After three hours Sharat leaves at the speed of $(x + 10)$ km/h from Lucknow towards Patna. If x and the number of hours taken to meet after Sharat starts are integers, how much distance can Mayank cover before they meet?
   (a) 174 km   (b) 60 km   (c) 150 km   (d) 180 km

6. Labour allocation is a very important process. A particular weaving section has 20 looms and with five labourers, loom efficiency is 75%. The production of a loom at 100% efficiency is 10 m/h. Salary of a labourer is Rs 11, 000 per month. I removed one labourer due to which the efficiency came down to 70%. How much do I gain or loose due to this action? (Assume that the profit on 1 m cloth is Rs 4 and the looms are working for 30 days in a month and 10 hours per day.)
   (a) Rs. 1,000 profit   (b) Rs. 1,500 loss   (c) Rs. 1,500 profit   (d) Rs. 1,000 loss

7. The time period of oscillation T for pendulum is given by $T = k\sqrt{\dfrac{\ell}{g}}$, where is ℓ the length of the pendulum and g is the acceleration due to gravity, 'k' is any constant. If 'k' and 'g' remain unchanged under any condition, what should be the percentage change in ℓ such that the time period T increases by 10%?
   (a) 10% increase   (b) 10% decrease   (c) 20% increase   (d) 21% increase

8. Let N be a set of real numbers such that p is any real number in the set. There exists two numbers in N whose average is p, then
   (a) N is finite set   (b) N is a set containing all real numbers
   (c) N is a set of all numbers in the interval (2, 3)   (d) None of these

9. Consider a circle with unit radius. There are seven adjacent sectors, $S_1, S_2, S_3 \ldots\ldots S_7$, in the circle such that their total area is $\dfrac{1}{8}$ th of the area of the circle. Further, the area of the jth sector is twice that of the $(j-1)$ th sector, for. What is the angle, in radians, subtended by the arc of S_1 at the centre of the circle?
   (a) $\dfrac{\pi}{508}$ (b) $\dfrac{\pi}{2040}$ (c) $\dfrac{\pi}{1016}$ (d) $\dfrac{\pi}{1524}$