PROBLEM SHEET–CATEGORY I

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1. *Find out all possible values of* A *and* H*, if* $A21H$ *is a four digit number divisible by* 9*.*

2. *What is* 4% *of* 4% *of* 16*?*

3. *Prove that the product of three consecutive natural numbers is always divisible by* 6*.*

4. *What is the ratio of the area of a square inscribed in a semicircle to the area of the square inscribed in the entire circle?*

5. *There are two bells which rings after* 20 *and* 30 *seconds respectively. If they both ring together at* 10 AM*, then how many times together would they ring till* 11 AM*?*

6. *Find the smallest integer* k *which when divided by* $6, 5, 4, 3$ *and* 2 *successively leaves remainder* $5, 4, 3, 2$ *and* 1 *respectively.*

7. *Find the angle between the hour hand and the minute hand of a clock at* $10:45$ PM*.*

8. *If the sum of the digits of a number between* 10 *and* 100 *is divisible by* 9*, then prove that the number is divisible by* 9*.*

9. *What is the last digit of* 7^{111}*?*

10. *The product of two numbers is* 19772 *and their HCF is* 16*. Find all such possible pairs of numbers.*

11. *Find the nearest integer to* 8511 *which is exactly divisible by* $8, 12, 16$ *and* 18*.*

12. *The sum of* n *positive integers is* nk*. Show that their product cannot exceed* k^n*.*

13. *Without calculating the square root, say whether* 172941042 *is a square or not?*

14. *Which number is greater,* 3^{100} *or* 4^{50}*?*

15. *Calculate the value of* $(2113)_3 + (1132)_5 + (1729)_6$*.*

16. *Prove that four digit number,* $abcd$ *is divisible by* 7 *iff* $abc - 2d$ *is divisible by* 7*.*

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