ST. ARNOLD'S CENTRAL SCHOOL, PUNE
PERIODIC TEST -1, 2018-19
SUBJECT: MATHEMATICS

STD: X M.M:50

SECTION –A

Question numbers 1 to 4 carry 1 mark each.

1. If a and b are two positive integers such that $a = 14b$, find the HCF of a and b. (1)
2. Has the rational number $\frac{441}{2 \times 5 \times 3}$ a terminating or non-terminating decimal representation? (1)
3. Show that $x = -2$ is a zero of the polynomial $p(x) = 3x^2 + 13x + 14$. (1)
4. Find the roots of the quadratic equation by factorization: $x^2 - 9x + 20. = 0$ (1)

SECTION – B

Question numbers 5 to 8 carry 2 marks each.

5. Find the HCF of 504 and 980, using Euclid's division algorithm. (2)
6. Sum and product of zeros of quadratic polynomial are 5 and 17 respectively. Find the polynomial. (2)
7. Find the value of k such that the quadratic equation $x^2 - 2kx + (7k - 12) = 0$ has equal roots. (2)
8. Is the following situation possible? The sum of ages of a mother and her daughter is 25 years. Five years ago the product of their ages was 58. (2)

SECTION – C

Question numbers 9 to 14 carry 3 marks each.

9. Prove that $\sqrt{3}$ is an irrational number. (3),
10. Use Euclid's division lemma to show that the square of any positive integer is either of the form 3m or 3m+1 for some integer m. (3)

11. Find the zeros of the quadratic equation $p(x) = x^2 + 7x + 12$ and verify the relationship between the zeroes and their coefficients. (3)

12. If α, β are zeroes of the polynomial $x^2 + 7x + 7$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$. (3)

13. Solve the following equation by the method of completing the square:
$9x^2 + 24x + 16 = 0$ (3)

14. A passenger train takes 2 hours less for a journey of 300km if its speed is increased by 5km/h from its usual speed. Find the usual speed of the train. (3)

SECTION – D

Question numbers 15 to 19 carry 4 marks each.

15. The length, breadth and height of a room are 8m 25cm, 6m75cm and 4m 50cm respectively. Determine the length of the longest rod which can measure the three dimensions of the room exactly. (4)

16. Divide $2x^4 - 9x^3 + 5x^2 + 3x - 8$ by $x^2 - 4x + 1$ and verify the division algorithm. (4)

17. Obtain all the zeroes of the polynomial $x^4 - 7x^3 + 17x^2 - 17x + 6$, if two of its zeroes are 3 and 1. (4)

18. The difference of two numbers is 5 and the difference of their reciprocals is $\frac{1}{10}$. Find the numbers. (4)

19. The length of the hypotenuse of a right triangle is one unit more than twice the length of the shortest side and the other side is one unit less than twice the length of the shortest side. Find the length of the other two sides. (4)