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SAMPLE PAPER 01 : PERIODIC TEST – 1 (2018 – 19)

SUBJECT: MATHEMATICS **MAX. MARKS : 80**
CLASS : X **DURATION : 3 HRS**

General Instruction:
(i) **All** questions are compulsory.
(ii) This question paper contains **30** questions divided into four Sections A, B, C and D.
(iii) **Section A** comprises of 6 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 10 questions of **3 marks** each and **Section D** comprises of 8 questions of **4 marks** each.
(iv) There is no overall choice.
(v) Use of Calculators is not permitted

SECTION – A(1 marks each)

1. Express 3825 as the product of its prime factors.

2. For the AP : $\frac{3}{2}, \frac{1}{2}, -\frac{1}{2}, -\frac{3}{2}, \ldots\ldots$, write the first term a and the common difference d.

3. Using comparing the ratios of coefficient, find out whether the pair of linear equations are consistent, or inconsistent : $3x + 2y = 5$; $2x - 3y = 7$

4. Find a quadratic polynomial, the sum and product of whose zeroes are – 3 and 5 respectively.

5. Find the discriminant of the equation $3x^2 - 2x + \frac{1}{3} = 0$ and hence find the nature of its roots.

6. If 2x, x + 10, 3x + 2 are in A.P., find the value of x.

SECTION – B(2 marks each)

7. Use Euclid's division algorithm to find the HCF of 135 and 225

8. Find the zeroes of the quadratic polynomial $5t^2 + 12t + 7$ and verify the relationship between the zeroes and the coefficients.

9. For which values of a and b does the following pair of linear equations have an infinite number of solutions?
$2x + 3y = 7$; $(a - b)x + (a + b)y = 3a + b - 2$

10. Find the 10th term from the last term of the AP : 8, 10, 12, . . ., 126.

11. Which term of the AP : 3, 15, 27, 39, . . . will be 132 more than its 54th term?

12. Find two numbers whose sum is 27 and product is 182.

SECTION – C(3 marks each)

13. Solve $2x + 3y = 11$ and $2x – 4y = – 24$ and hence find the value of 'm' for which $y = mx + 3$.

14. Solve the following pair of linear equations:
$px + qy = p – q$; $qx – py = p + q$

15. Find the HCF and LCM of 96 and 404 by the prime factorisation method and verify that LCM × HCF = product of the two numbers.

16. Prove that $\sqrt{5}$ is an irrational number.

17. On dividing $x^3 – 3x^2 + x + 2$ by a polynomial g(x), the quotient and remainder were $x – 2$ and $–2x + 4$, respectively. Find g(x).

18. If the zeroes of the polynomial $x^3 – 3x^2 + x + 1$ are $a – b$, a, $a + b$, find a and b.

19. If the sum of the first 14 terms of an AP is 1050 and its first term is 10, find the 20th term.

20. Subba Rao started work in 1995 at an annual salary of Rs 5000 and received an increment of Rs 200 each year. In which year did his income reach Rs 7000?

21. Find the roots of $\frac{1}{x}-\frac{1}{x-2}=3, x \neq 0, 2$

22. Find the roots of the equation $5x^2 – 6x – 2 = 0$, by method of competing the square.

SECTION – D(4 marks each)

23. Places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. What are the speeds of the two cars?

24. Draw the graphs of the equations $5x – y = 5$ and $3x – y = 3$. Determine the co-ordinates of the vertices of the triangle formed by these lines and the y axis.

25. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

26. Solve the equation: $2\left(\frac{2x-1}{x+3}\right)-3\left(\frac{x+3}{2x-1}\right)=5, \left(x \neq -3, \frac{1}{2}\right)$

27. Use Euclid's division lemma to show that the cube of any positive integer is of the form 9m, 9m + 1 or 9m + 8.

28. How many terms of the AP : 24, 21, 18, . . . must be taken so that their sum is 78? Explain the double answer.

29. In a school, students thought of planting trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying, e.g., a section of Class I will plant 1 tree, a section of Class II will plant 2 trees and so on till Class XII. There are three sections of each class. How many trees will be planted by the students? What value depicted from these?

30. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be $x + a$, find k and a.