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**SAMPLE PAPER 03 : PERIODIC TEST – 1 (2018 – 19)**

**SUBJECT: MATHEMATICS**

**MAX. MARKS : 80**

**CLASS : X**

**DURATION : 3 HRS**

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**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
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**SECTION – A(1 marks each)**

1. For what values of  $k$  will the following pair of linear equations have infinitely many solutions?  
 $kx + 3y - (k - 3) = 0$  and  $12x + ky - k = 0$
2. State Euclid's Division Lemma.
3. Find the quadratic polynomial whose zeroes are  $7 + \sqrt{3}$  and  $7 - \sqrt{3}$ .
4. Find the nature of the roots of the quadratic equation  $2x^2 - 3x + 5 = 0$ .
5. Write first two terms of the AP, when the first term  $a$  is  $-1$  and the common difference  $d$  is  $\frac{1}{2}$ .
6. The angles of a quadrilateral are in AP whose common difference is  $10^\circ$ . Find the angles.

**SECTION – B(2 marks each)**

7. Find the HCF and LCM of 6, 72 and 120, using the prime factorisation method.
8. Find the quotient and remainder when  $4x^3 + 2x^2 + 5x - 6$  is divided by  $2x^2 + 3x + 1$ .
9. Find the roots of the equation  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$
10. The sum of  $n$  terms of an AP is  $(5n^2 - 3n)$ . Find the AP and hence find its  $10^{\text{th}}$  term.
11. Solve the following pair of linear equations:  $x + y = 5$  and  $2x - 3y = 4$
12. Which term of the AP 24, 21, 18, 15, .... is first negative term?

**SECTION – C(3 marks each)**

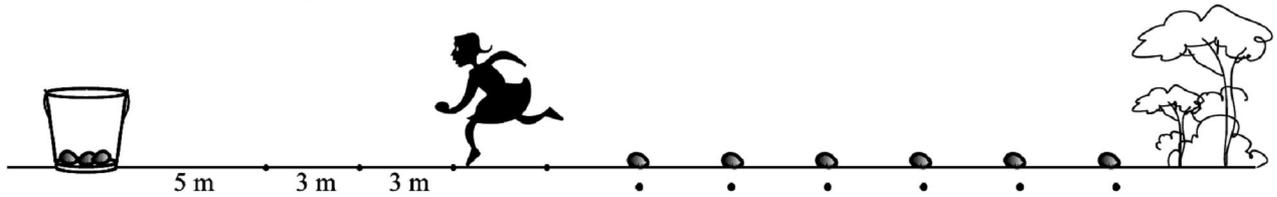
13. Prove that  $7 - 2\sqrt{3}$  is an irrational number.

14. A sweetseller has 420 kaju barfis and 130 badam barfis. She wants to stack them in such a way that each stack has the same number, and they take up the least area of the tray. What is the maximum number of barfis that can be placed in each stack for this purpose?
15. Solve the following pair of linear equations::  $\frac{x}{a} - \frac{y}{b} = 0$ ;  $ax + by = a^2 + b^2$
16. Solve the following pairs of equations by reducing them to a pair of linear equations:  
 $\frac{1}{2x} + \frac{1}{3y} = 2$ ;  $\frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$
17. Find  $k$  so that  $x^2 + 2x + k$  is a factor of  $2x^4 + x^3 - 14x^2 + 5x + 6$ . Also find all the zeroes of the two polynomials.
18. If  $\alpha$  and  $\beta$  are the zeroes of the quadratic polynomial such that  $\alpha + \beta = 24$  and  $\alpha - \beta = 8$ , find a quadratic polynomial having  $\alpha$  and  $\beta$  as its zeroes.
19. Find the roots of the equation:  $x + \frac{1}{x} = 3, x \neq 0$ .
20. The first and the last terms of an AP are 17 and 350 respectively. If the common difference is 9, how many terms are there and what is their sum?
21. If  $-4$  is a root of the equation  $x^2 + px - 4 = 0$  and the equation  $x^2 + px + q = 0$  has equal roots, find the value of  $p$  and  $q$ .
22. Find the sum of first 24 terms of the list of numbers whose  $n$ th term is given by  $a_n = 3 + 2n$

### SECTION – D(4 marks each)

23. Draw the graphs of the equations  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinates of the vertices of the triangle formed by these lines and the  $x$ -axis, and shade the triangular region.
24. A train covered a certain distance at a uniform speed. If the train would have been 10 km/h faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/h; it would have taken 3 hours more than the scheduled time. Find the distance covered by the train.
25. The houses of a row are numbered consecutively from 1 to 49. Show that there is a value of  $x$  such that the sum of the numbers of the houses preceding the house numbered  $x$  is equal to the sum of the numbers of the houses following it. Find this value of  $x$ .
26. Solve the equation:  $\left(\frac{4x-3}{2x+1}\right) - 10\left(\frac{2x+1}{4x-3}\right) = 3, \left(x \neq \frac{-1}{2}, \frac{3}{4}\right)$

27. In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line (see the below figure).



A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run? Write the benefits of participating in sports?

28. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

29. Obtain all the zeroes of  $3x^4 + 6x^3 - 2x^2 - 10x - 5$ , if two of its zeroes are  $\sqrt{\frac{5}{3}}$  and  $-\sqrt{\frac{5}{3}}$ .

30. Show that any positive odd integer is of the form  $6q + 1$  or  $6q + 3$  or  $6q + 5$  where  $q \in \mathbb{Z}$