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SAMPLE PAPER 02 : PERIODIC TEST – 1 (2018 – 19)

SUBJECT: MATHEMATICS
CLASS : X

MAX. MARKS : 80
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
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SECTION – A(1 marks each)

1. Given that $HCF(306, 657) = 9$, find $LCM(306, 657)$.
2. For which value of k will the following pair of linear equations have no solution?
 $3x + y = 1$ and $(2k - 1)x + (k - 1)y = 2k + 1$
3. Find a quadratic polynomial whose zeroes are 3 and 2.
4. Find the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$, and hence find the nature of its roots.
5. For the AP: $-5, -1, 3, 7, \dots$, write the first term and the common difference:
6. Find the value of x for which $(8x + 4)$, $(6x - 2)$ and $(2x + 7)$ are in AP.

SECTION – B(2 marks each)

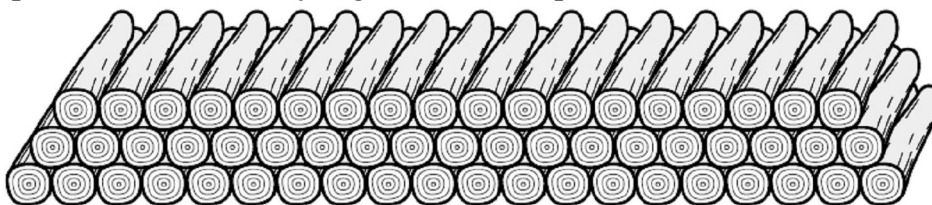
7. Find the zeroes of the quadratic polynomial $3x^2 - x - 4$ and verify the relationship between the zeroes and the coefficients.
8. Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36m. Find the dimensions of the garden.
9. Which term of the AP $3, 8, 13, 18, \dots$ will be 55 more than its 20th term?
10. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$, where q is some integer.
11. Find the 10th term from the last term of the AP : $8, 10, 12, \dots, 126$.
12. Find the roots of the equation $2x^2 - x + \frac{1}{8} = 0$.

SECTION – C(3 marks each)

13. Prove that $5 - 3\sqrt{2}$ is an irrational number.
14. Find the least number which when divided by 6, 15 and 18 leave remainder 5 in each case.
15. If α and β are the zeroes of the quadratic polynomial $f(x) = 2x^2 - 5x + 7$, then find a quadratic polynomial whose zeroes are $2\alpha + 3\beta$ and $2\beta + 3\alpha$.
16. Divide $3x^2 - x^3 - 3x + 5$ by $x - 1 - x^2$, and verify the division algorithm.
17. Solve : $(a - b)x + (a + b)y = a^2 - 2ab - b^2$
 $(a + b)(x + y) = a^2 + b^2$
18. Solve the following pairs of equations by reducing them to a pair of linear equations:
 $6x + 3y = 6xy$ and $2x + 4y = 5xy$
19. If the sum of first 7 terms of AP is 49 and that of first 17 terms is 289, find the sum of first n terms.
20. Which term of the AP : 121, 117, 113, . . . , is its first negative term?
21. Find the roots of the equation: $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}, x \neq -4, 7$
22. Find the roots of the equation $2x^2 - 5x + 3 = 0$, by method of competing the square.

SECTION – D(4 marks each)

23. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?
24. Draw the graphs of the equations $2x - y = 2$ and $4x - y = 4$. Determine the co-ordinates of the vertices of the triangle formed by these lines and the y axis.
25. 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 .
26. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on (see the below figure). In how many rows are the 200 logs placed and how many logs are in the top row?



27. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if you know that two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$.
28. The sum of the third and the seventh terms of an AP is 6 and their product is 8. Find the sum of first sixteen terms of the AP.
29. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected?
30. An express train takes 1 hour less than a passenger train to travel 132 km between Mysore and Bangalore (without taking into consideration the time they stop at intermediate stations). If the average speed of the express train is 11km/h more than that of the passenger train, find the average speed of the two trains. Write any one common safety problem and solution on speed limit.
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