ATOMIC ENERGY EDUCATION SOCIETY
PERIODIC TEST – II (2018-19)

CLASS : X **DATE OF EXAM: 01-10-18** **TIME: 3 HOURS**
**SUBJECT: MATHEMATICS** **MARKS: 80**

General Instructions:
(i) All questions are compulsory.
(ii) The question paper consists of **30** questions divided into four sections **A, B, C** and **D.**
(iii) Section **A** contains **6** questions of **1** mark each.
   Section **B** contains **6** questions of **2** marks each.
   Section **C** contains **10** questions of **3** marks each.
   Section **D** contains **8** questions of **4** marks each.
(iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and two questions of 4 mark each. You have to attempt only one of the alternatives in all such questions.
(v) Use of **calculators** is not permitted.

SECTION – A

1. The decimal expansion of the rational number $\dfrac{63}{2^4 \times 5^3}$ will terminate after how many decimal places? **1**

2. Given that LCM (91, 26) = 182, then find HCF (91, 26) **1**

3. If $(x + a)$ is a factor of $2x^2 + 2ax + 5x + 10$, find a. **1**

4. Write the number of zeroes of the polynomial $y = f(x)$ whose graph is given in the figure. **1**

  1
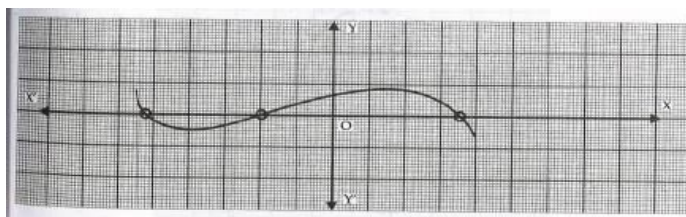
5. How many solutions does the pair of linear equations : **1**
   $x + 4y - 8 = 0$, $3x + 12y = 24$ have?

6. Find the next term of the A.P. $\sqrt{2}$, $\sqrt{8}$, $\sqrt{18}$...

SECTION — B

7. Find the value of k for which the roots of the quadratic equation $kx^2 - 10x + 5 = 0$ are equal.   2

8. Solve the quadratic equation $2x^2 + 4x - 8 = 0$ 2

9. For what value of p, the points $(-5, 1)$, $(1, p)$ and $(4, -2)$ are collinear?   2

10. PQR is an isosceles triangle with QP=QR. If $PR^2 = 2QR^2$, prove that ΔPQR is right angled.   2

11. A 20 m long vertical pole casts a shadow 10 m long on the ground. At the same time a tower casts a shadow 50 m long on the ground. Find the height of the tower.   2

12. If areas of two similar triangles are in the ratio 25:64, write the ratio of their corresponding sides.   2

SECTION — C

13. The sum of 4th and 8th terms of an A.P is 37 and the sum of 6th and 12th terms is 46. Find the first term of the A.P.   3

14. Solve for x: $3a^2x^2 + 8abx + 4b^2 = 0$.   3

OR

Solve for x: $\dfrac{1}{x} - \dfrac{1}{x-3} = \dfrac{4}{3}$;   x=not equal to 4,3

15. Determine the sum of all multiples of 9 lying between 100 and 200.   3

OR

Find the sum of first 20 terms of an A.P whose nth term is $4n - 1$.

16. 4 men and 6 boys can finish a piece of work in 5 days while 3 men and 4 boys can finish it in 7 days. Find the time taken by 1 man alone or by 1 boy alone.   3

17. Find the greatest number of 5 digits exactly divisible by 12, 15 and 36.   3

18. ABC is a right triangle, right angled at A, and D is the mid-point of AB. Prove that $BC^2 = CD^2 + 3BD^2$.   3

OR

E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that ΔABE is similar to ΔCFB.

19. A charity trust decided to build an anti-disaster rectangular hall having a carpet area of 210 sq.m. If the length is 1 more than twice its breadth, construct the quadratic Equation to solve for the length and breadth? What value do you imbibe from this act?   3

20. If the polynomial $4x^4 + 6x^3 + 13x^2 + 20x + 7$ is divided by another polynomial $3x^2 + 4x + 1$ then the remainder come out to be ax + b, find 'a' and 'b'.   3

OR

Find the value for K for which $x^4 + 10x^3 + 25x^2 + 15x + K$ exactly divisible by x + 7

21. If α & ß are the zeroes of the polynomial $2x^2-4x+5$, then find the value of $\alpha^2 + \beta^2$ 3

22. In the given figure, ABC is a right-angled triangle at C. AD =3 cm , DC=2 cm ,   3
BC= 12 cm. Prove that $\triangle ABC \sim \triangle ADE$ and find the lengths of AE and DE.
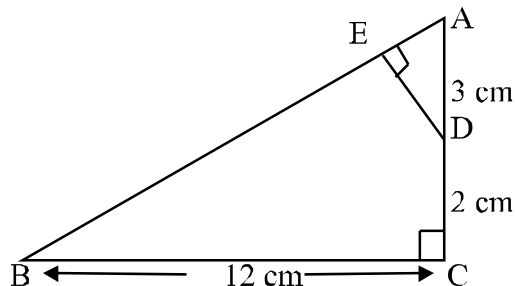
SECTION – D

23 Solve the following system of equations graphically and find the vertices of the triangle   4
formed by these lines and the x-axis.
$4x - 3y + 4 = 0, \quad 4x + 3y - 20 = 0$

OR

Draw the graphs of the equations $2x - y = - 8, 8x + 3y = 24$. Determine the vertices of the
triangle formed by the lines representing these equations and the x-axis. Shade the
triangular region formed.

24 Nine times a two-digit number is the same as twice the number obtained by interchanging   4
the digits of the number. If one digit of the number exceeds the other number by 7, find
the number.

25 Find all the zeroes of the polynomial $x^4 - 5x^3 + 2x^2 + 10x - 8$, if two of its zeroes are   4
$\sqrt{2},-\sqrt{2}$.

26 In what ratio does the x-axis divide the line segment joining the points (–4, –6) and   4
(–1, 7)? Find the co-ordinates of the point of division.

27 In an A.P. the sum of its first ten terms is -150 and the sum of its next 10 terms is -550.   4
Find the A.P.

28 AD is the median of $\triangle ABC$, O is any point on AD. BO and CO produced meet AC and   4
AB in E and F respectively. AD is produced to X such that OD = DX. Prove that AO :
AX = AF : AB.

29 The diagonals of a trapezium ABCD with AB || DC intersect each other at point O.   4
If AB = 2CD, find the ratio of the areas of triangles AOB and COD.

30 If α and β are zeroes of the polynomial : $p(x) = x^2 - 2x+ 3$, find a quadratic polynomial   4
whose zeroes are α + 2 and β − 2.