APEEJAY SCHOOL, SHEIKH SARAI-I

PERIODIC ASSESSMENT-II, 2017-18

CLASS-X

MATHEMATICS

Time allowed : 3 hrs. *M.M. : 80*

General Instructions :

- *Q. Nos. 1 – 6 carry 1 mark each.*
  Q. Nos. 7 – 16 carry 2 marks each.
  Q. Nos. 17 – 26 carry 3 marks each.
  Q. Nos. 27 – 31 carry 4 marks each.
- *All questions are compulsory.*
- *Internal choice is provided between questions.*

1. Examine whether $\frac{17}{30}$ has a terminating decimal representation or not.
2. Form a quadratic equation whose sum and product of roots is 4 and $-1/4$.
3. Examine whether the system of equations $2x+3y-4=0$ and $7x-4y+6=0$ is consistent.
4. Find the value of $\frac{\sin 18^\circ}{\cos 72^\circ}$.
5. The ratio of the height of a tree and its shadow is 1 : 1. The Sun's angle of elevation is.
6. If L.C.M. (26, 169) = 338, find their H.C.F.
7. If α, β are zeros of $p(x)=x^2-5x+6$, then find the value of $\alpha+\beta-3\alpha\beta$.
8. Prove that $7+2\sqrt{3}$ is irrational.
9. If one root of $p(x)=5x^2+13x+m$ is reciprocal of the other, find the value of 'm'.
10. Find the value of 'k' for which the system of equations $x+3y-4=0$ and $2x+ky=7$ is inconsistent.
11. Find the value of 'p'. So that $px(x-3)+9=0$ has equal roots.
12. The ratio of the corresponding altitudes of two similar triangles is $\frac{2}{5}$. Find the ratio of the areas of the triangles.

P.T.O.

13. ABC is an isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$.

14. If $\tan 3A = \cot(A - 26°)$, $3A \angle 90°$, find the value of $\angle A$.

15. Write the median class of the following distribution :

0–10	10–20	20–30	30–40	40–50
14	6	8	20	15

16. Find the H.C.F. of 867 and 255, using Euclid's division alogrithm.

17. Solve graphically $2x + 4y - 10 = 0$ and $3x + 6y - 12 = 0$.

18. Solve :

$$\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2 \text{ and } \frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1.$$

19. The sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares.

20. Solve : $abx^2 + (b^2 - ac)x - bc = 0$.

OR

$4x^2 + 4\sqrt{3}x + 3 = 0$.

21. In an equilateral triangle ABC, D is a point on side BC such that $BD = \frac{1}{3}BC$. Prove that $9AD^2 = 7AB^2$.

22. Prove that the area of an equilateral triangle described on a side of a right angled isosceles triangle is half the area of the equilateral triangle described on its hypotenuse.

23. Prove that $\sqrt{\sec^2\theta + \text{cosec}^2\theta} = \tan\theta + \cot\theta$.

24. If $\text{cosec}^2\theta(1 + \cos\theta)(1 - \cos\theta) = \alpha$, find the value of α.

25. Find the arithmetic mean in the given frequency distribution :

Class	0–5	6–11	12–17	18–23	24-29
Frequency	15	10	15	8	12

26. Obtain all other zeros of $p(x) = 2x^3 + x^2 - 6x - 3$, if two of its zeros are $-\sqrt{3}$ and $\sqrt{3}$.

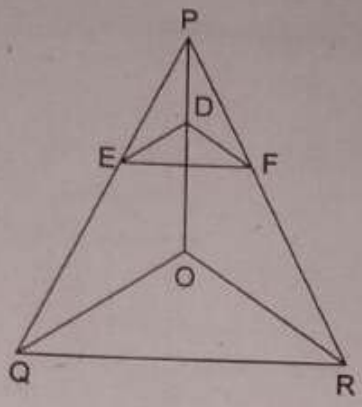
27. A two digit number is 4 times the sum of its digits and twice the product of the digits. Find the number.

28. Solve :

$$\frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x}, a \text{ and } b \neq 0.$$

29. (a) State Basic Proportionality theorem.

(b) In the given figure $DE \| OQ$, $DF \| OR$. Show that $EF \| QR$.



30. Prove that : $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$.

OR

The angle of elevation of the top of a tower from two points at a distance of 's' and 't' from its foot are complementary. Prove that the height of the tower is $\sqrt{st}$.

31. Find the median graphically of the following data :

Class	0–5	5–10	10–15	15–20	20-25	25-30	30-35
Frequency	16	12	20	18	9	15	10

32. A man on the top of a vertical tower observes a car moving at a uniform speed coming directly towards it. If it takes 12 minutes for the angle of depression to change from 30° to 45°, find the time taken by the car to reach the tower.