

Roll No. : 

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Candidates must write the Set No.  
on the title page of the answer**DAV PUBLIC SCHOOLS, ODISHA ZONE-1****PERIODIC TEST-II, 2017-18**

- Check that this question paper contains 4 printed pages
- Set number given on the right hand side of the question paper should be written on the title page of the answer book by the candidate.
- Check that this question paper contains 30 questions.
- Write down the Serial Number of the question before attempting it.
- 15 minutes cooling time has been allotted to read this question paper only and do not write any answer on the answer book during this period.

**CLASS-X****MATHEMATICS****Time allowed: 3 hours****Maximum marks:80****General Instructions**

1. All questions are compulsory
2. The question paper consists of 30 questions divided into four sections A,B,C,D .  
Section A comprises of 6 questions of one mark each , section B comprises 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
3. There is no overall choice given.
4. Use of calculators is not permitted.

**Section-A**

1. If it is given that  $\Delta ABC \sim \Delta QRP$  ,  $ar(ABC):ar(PQR) = 9:4$  ,  $AB = 18cm$  and  $BC = 15cm$ , then find PR .
2. Find the value of 'k' for which the system of following equations has a unique solution.  
 $kx - y = 2$  and  $6x - 2y = 3$
3. If one root of the polynomial  $f(x) = 5x^2 + 13x + k$  is reciprocal of the other , then find the value of 'k'.

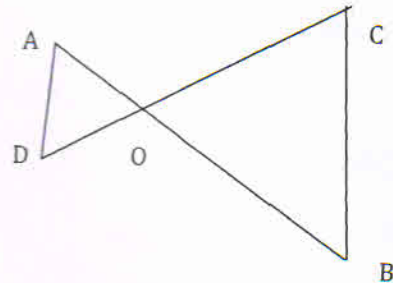
4. If  $\tan A = \cot B$ , find  $A+B$ .
5. If the mean of 6,7,x,8,y,14 is 9, then find  $x+y$ .
6. If the HCF of 65 and 117 is expressible in the form of  $65m - 117$ , then find 'm'

**Section-B**

7. If  $\sin \theta - \cos \theta = 0$ , then find the value of  $\sin^4 \theta + \cos^4 \theta$ .
8. Find the mode of the following distribution of marks obtained by 80 students

Marks Obtained	0-10	10-20	20-30	30-40	40-50
No. Of students	6	10	12	32	20

9. In the figure if  $OA \cdot OB = OC \cdot OD$ , prove that  $\angle A = \angle C$  and  $\angle B = \angle D$



10. If ABC is an equilateral triangle of side length '2a', find the length of its each altitude.
11. If one of the zeroes of the cubic polynomial  $x^3 + ax^2 + bx + c$  is -1, then find the product of other two zeroes.
12. For what values of 'k' will the following pair of linear equations have infinitely many solutions?  
 $kx + 3y - (k - 3) = 0$ ,  $12x + ky - k = 0$

**Section-C**

13. Solve the pair of equations  $\frac{10}{x+y} + \frac{2}{x-y} = 4$  and  $\frac{15}{x+y} - \frac{5}{x-y} = -2$ .
14. In an equilateral triangle ABC, D is a point on side BC such that  $BD = \frac{1}{3} BC$ , prove that  $9AD^2 = 7AB^2$ .

15. The annual rainfall record of a city for 70 days is given in the following table. Calculate the median rainfall.

Rainfall (in cm)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Number of days	22	10	8	15	5	6	4

16. The mileage (km per litre) of 50 cars of the same model was tested by a manufacturer and details are given below:

Mileage(km/lit)	10-12	12-14	14-16	16-18
Number of cars	7	12	18	13

Find the mean mileage. The manufacturer claimed that the mileage of the model was 16km/lit. Do you agree with this claim?

17. The monthly profit (in Rs) of 100 shops are distributed as follows :

Profits per shop	0-50	50-100	100-150	10-200	200-250	250-300
No. Of shops	12	18	27	20	17	6

Draw the frequency polygon for the above data.

18. In  $\triangle ABC$ , right angled at B,  $AB=5$  cm and  $\angle ACB = 30^\circ$ . Determine the lengths of the sides BC and AC.

19. Show that  $\tan^4\theta + \tan^2\theta = \sec^4\theta - \sec^2\theta$ .

20. If  $\sin(A + B) = 1$  and  $\cos(A - B) = \frac{\sqrt{3}}{2}$ ,  $0^\circ < A + B \leq 90^\circ$ ,  $A > B$ . Then find A and B.

21. Prove that  $5 - \sqrt{3}$  is an irrational number.

22. Given that the zeroes of the cubic polynomial

$x^3 - 6x^2 + 3x + 10$  are of the form  $a, a + b, a + 2b$ , for some real numbers  $a$  and  $b$ , find the values of  $a$  and  $b$  as well as the zeroes of the polynomial.

304 310

Section-D

23. The diagonals of a quadrilateral ABCD intersect each other at the point O such that  $\frac{AO}{BO} = \frac{CO}{DO}$ . Show that ABCD is a trapezium .

24. BL and CM are medians of a triangle ABC right angled at A . Prove that  $4(BL^2 + CM^2) = 5BC^2$

25. The following table gives the weights of 40 students of a class.

Weight (in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Number of students	4	4	13	5	6	5	3

Draw its Ogive(of less than type and of more than type). Hence find the median.

Overweight is a problem . Explain how?

26. The mean of the following frequency table is 50. Find the missing frequencies

Class	0-20	20-40	40-60	60-80	80-100	Total
Frequency	17	$f_1$	32	$f_2$	19	120

27. In a right triangle ,the square of the hypotenuse is equal to the sum of squares of the other two sides . Prove it.

28. If  $\sin \theta + \cos \theta = p$  and  $\sec \theta + \operatorname{cosec} \theta = q$ ,  
prove that  $q(p^2 - 1) = 2p$  .

29. 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  $a$  .

30. A train covered a certain distance at a uniform speed. If the train would have been 10km/hr faster , it would have taken 2 hours less than the scheduled time. And if the train were slower by 10km/hr , it would have taken 3 hours more than the scheduled time. Find the distance covered by train .

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