

ST. ARNOLD'S CENTRAL SCHOOL , PUNE
PERIODIC TEST – 3 , 2018 – 19
SUBJECT : MATHEMATICS

STD : X

M.M : 50

SECTION – A

Question numbers 1 to 4 carry 1 mark each

1. Find the common difference of the A.P 3, 1, -1, -3..... (1)
2. Find the distance of the point (-6,8) from the origin. (1)
3. If $\sqrt{3} \tan\theta = 1$, then find the value of $\sin\theta$. (1)
4. If P(a,4) is the midpoint of the line segment joining the point Q(-6,5) and R(-2,3), then find the value of 'a'. (1)

SECTION – B

Question numbers 5 to 8 carry 2 marks each

5. If the point C(-1,2) divides internally the line segment joining A(2,5) and B(x,y) in the ratio 3:4, then find the coordinates of B. (2)
6. Determine 'a', so that $2a + 1$, $a^2 + a + 1$ and $3a^2 - 3a + 3$ are consecutive terms of an A.P. (2)
7. Prove that $\frac{\sin\theta}{\sin(90-\theta)} + \frac{\cos\theta}{\cos(90-\theta)} = \sec\theta \operatorname{cosec}\theta$ (2)
8. If the sixth term of an A.P is -10 and its tenth term is -26, then find the fifteenth term of this A.P. (2)

SECTION – C

Question numbers 9 to 14 carry 3 marks each

9. Compute the median of the following data (3)

Class Interval	500 - 600	600 - 700	700 - 800	800 - 900	900 – 1000
Frequency	40	28	35	22	25

10. Which term of the A.P 3, 10, 17,..... will be 84 more than its thirteenth term? (3)

OR

Ramesh saves Rs 32 during the first month, Rs 36 in the second month, Rs 40 in the third month. If he continues to save in this manner, in how many months will he save Rs 2000. (3)

11. If $\operatorname{cosec}\theta = \frac{13}{12}$, then evaluate $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$ (3)

12. Find the value of 'k' for which the points A(-1,3), B(2,k) and C(5,-1) are collinear (3)

OR

Find the area of the rhombus ABCD if its vertices are A(3,0), B(4,5), C(-1,4) and D(-2,-1). (3)

13. If $\triangle ABC$ is a right angled triangle, with angle $B=90^\circ$, $BC = 7\text{cm}$ and $AC - AB = 1\text{ cm}$. Find the value of $\cos A - \sin A$. (3)

14. If P(x,y) is any point on the line segment joining the points A(a,0) and B(0,b), then show that $\frac{x}{a} + \frac{y}{b} = 1$. (3)

SECTION – D

Question numbers 15 to 19 carry 4 marks each

15. Change the following data into less than type distribution and draw its ogive. Also find the median from the graph. (4)

Class Interval	50 – 60	60 - 70	70 - 80	80 - 90	90 – 100
Frequency	3	5	9	12	6

16. In an A.P, the sum of first n terms is given by $S_n = \frac{3n^2}{2} + \frac{5n}{2}$. Find the 25th term of the A.P. (4)

17. In $\triangle ABC$, the coordinates of vertices are A(4,-2), B(2,-2) and C(6,-1). D and E are the midpoints of sides BC and AC respectively. Find the length of DE. Prove that $DE = \frac{1}{2} AB$. (4)

18. Evaluate $\frac{\tan^2 60^\circ + 4\sin^2 45^\circ + 3\sec^2 30^\circ + 5\cos^2 90^\circ}{\operatorname{cosec} 30^\circ + \sec 60^\circ - \cot^2 30^\circ}$ (4)

OR

Prove that $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta \operatorname{cosec}\theta$. (4)

19. Prove that the points A(-4,-1), B(-2,-4), C(4,0) and D(2,3) are the vertices of a rectangle. (4)