



विद्या सर्वार्थ साधिका

ANANDALAYA
PERIODIC TEST-2
Class : XI

Subject: Mathematics
Date : 26/12/2019

M.M: 40
Time: 2 Hours

General Instructions:

- i) All questions are compulsory.
- ii) This question paper contains 18 questions.
- iii) Questions 1 – 8 in Section A are very short-answer type questions carrying 1 mark each.
- iv) Questions 9 – 13 in Section B are short-answer type questions carrying 2 marks each.
- v) Questions 14 – 17 in Section C are long-answer I type questions carrying 4 marks each.
- vi) Question 18 in Section D is long-answer II type question carrying 6 marks.

SECTION – A

1. How many terms of the series $1 + 2 + 4 + 8 + \dots$ must be taken to make the sum 255? (1)
a) 10 b) 8 c) 7 d) 9
2. The equation of the line passing through the point (4, 5) and parallel to the line $2x - 3y - 5 = 0$ is ___. (1)
a) $2x + 3y + 7 = 0$ b) $2x - 3y - 7 = 0$ c) $2x - 3y + 7 = 0$ d) $3x - 2y + 7 = 0$
3. What is the eccentricity of the curve $4x^2 + y^2 = 100$? (1)
a) $\frac{\sqrt{3}}{2}$ b) $\sqrt{3}$ c) $\frac{\sqrt{2}}{3}$ d) none of these
4. Find the ratio, in which the line joining the points P (4, 8, 10) and Q (6, 10, -8) is divided by XY-plane. (1)
a) 5 : 4 internally b) 3 : 4 internally c) 5 : 3 internally d) none of these
5. If the p^{th} term of an A.P. is q and q^{th} term is p , then its n^{th} term is _____. (1)
6. Find the distance between the parallel lines $2x - 3y + 9 = 0$ and $4x - 6y + 1 = 0$. (1)
7. Find the equation of a circle concentric with the circle $3x^2 + 3y^2 - 12x - 18y - 5 = 0$ and which touches y-axis. (1)
8. Find the equation of the line through the point (3, -4) and parallel to the x-axis. (1)

SECTION – B

9. Line through the points (-2, 6) and (4, 8) is perpendicular to the line through the points (8, 12) and (x, 24), find the value of x. (2)

OR

What are the points on x-axis whose perpendicular distance from the line $4x + 3y = 12$ is 4?

10. Find the equation of a circle whose centre is $(3, -1)$ and which cuts off a chord of length 6 units on the line $2x - 5y + 18 = 0$. (2)

OR

Find the equation of the ellipse whose vertices are $(0, \pm 6)$ and eccentricity is $\frac{1}{3}$.

11. Find the equation of the line passing through the point $(1, 3)$ such that the intercept on the y -axis exceeds the intercept on the x -axis by 4. (2)

12. Three consecutive vertices of a parallelogram ABCD are A $(3, -1, 2)$, B $(1, 2, -4)$ and C $(-1, 1, 2)$. Find the fourth vertex. (2)

13. The product of three numbers in A.P. is 224, and the largest number is 7 times the smallest. Find the numbers. (2)

SECTION – C

14. Find the sum of ' n ' terms of the series: $0.5 + 0.55 + 0.555 + \dots \dots n$ terms. (4)

OR

In an increasing G.P., the sum of the first and last term is 66, and product of the second and last but one term is 128. If the sum of the series is 126, find the number of terms in the series.

15. Find the equation of the line through the point $(3, 2)$ which makes an angle of 45° with the line $x - 2y = 3$. (4)

OR

Find the equation of the line passing through the intersection of the lines $x + y + 3 = 0$ and $2x - y + 2 = 0$ and parallel to the line $3x + y + 4 = 0$.

16. Find the equation of the circle which passes through the centre of the circle $x^2 + y^2 + 8x + 10y - 7 = 0$ and is concentric with the circle $2x^2 + 2y^2 - 8x - 12y - 9 = 0$. (4)

17. Determine the point in YZ-plane which is equidistant from three points A $(2, 0, 3)$, B $(0, 3, 2)$ and C $(0, 0, 1)$. (4)

SECTION – D

18. Show that:
$$\frac{1 \times 2^2 + 2 \times 3^2 + \dots + n \times (n+1)^2}{1^2 \times 2 + 2^2 \times 3 + \dots + n^2 \times (n+1)} = \frac{3n+5}{3n+1}$$
 (6)

OR

Let S be the sum, P the product and R the reciprocals of n terms in a G.P. Prove that $P^2R^n = S^n$.