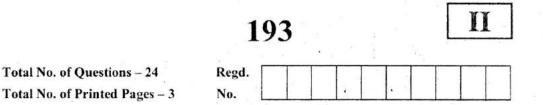


# **AP BOARD INTERMEDIARY 1ST YEAR PREVIOUS YEAR PAPER** MATHEMATICS 1(B) - 2017



Part - III **MATHEMATICS**, Paper-I(B) (English Version)

Time : 3 Hours]

Total No. of Questions - 24

[Max. Marks : 75

 $10 \times 2 = 20$ 

Note: This question paper consists of three sections A, B and C.

## SECTION - A

#### I. Very Short Answer Type questions :

- Answer all questions. (i)
- Each question carries two marks. (ii)
- Ĩ., Find the slopes of the lines x + y = 0 and x - y = 0.
- . 2. Transform the equation x + y + 1 = 0 into normal form.
- If (3, 2, -1), (4, 1, 1) and (6, 2, 5) are three vertices and (4, 2, 2) is the centroid 3. of a tetrahedron, find the fourth vertex.
- Find the angle between the planes 2x y + z = 6 and x + y + 2z = 7. 4.

5. Compute 
$$\lim_{x \to 0} \frac{e^{7x} - 1}{x}$$

5. Compute 
$$\lim_{x \to \infty} \frac{x^2 + 5x + 2}{2x^2 - 5x + 1}$$

Find the derivative of 5 sin  $x + e^{x} \log x$ . 7.

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- 8. Find the derivative of  $\sec^{-1}\left(\frac{1}{2x^2 1}\right), \left(0 < x < \frac{1}{\sqrt{2}}\right)$ .
- 9. Find dy and  $\Delta y$  of  $y = f(x) = x^2 + x$  at x = 10 when  $\Delta x = 0.1$
- 10. Verify Rolle's theorem for the function  $y = f(x) = x^2 + 4$  in [-3, 3].

### SECTION – B

 $5 \times 4 = 20$ 

II. Short Answer Type questions : .

- (i) Attempt any five questions.
- (ii) Each question carries four marks.
- 11. A(1, 2), B(2, -3) and C(-2, 3) are three points. A point P moves such that  $PA^2 + PB^2 = 2PC^2$  then find the equation of locus of P.
- 12. When the axes are rotated through an angle  $\frac{\pi}{4}$ , find the transformed equation of  $3x^2 + 10xy + 3y^2 = 9$
- 13. Find the value of P, if the lines 3x + 4y = 5, 2x + 3y = 4, Px + 4y = 6 are concurrent.
- 14. Check the continuity of the following function at 2

$$f(x) = \begin{cases} \frac{1}{2}(x^2 - 4) & \text{if } 0 < x < 2\\ 0 & \text{if } x = 2\\ 2 - 8x^{-3} & \text{if } x > 2 \end{cases}$$

- 15. Find the derivative of cot *x* from the first principle.
- 16. A particle is moving in a straight line so that after 't' seconds its distance is S (in cms) from a fixed point on the line given by  $S = f(t) = 8t + t^3$ . Find (i) the velocity at time t = 2 sec, (ii) the initial velocity and (iii) acceleration at t = 2 sec.
- 17. Find the equations of tangent and normal to the curve xy = 10 at (2, 5).

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# SECTION - C

#### $5 \times 7 = 35$

- III. Long Answer Type questions :
  - (i) Attempt any five questions.
  - (ii) Each question carries seven marks.
  - 18. Find the circumcenter of the triangle whose vertices are (-2, 3), (2, -1) and (4, 0).
  - 19. Show that the area of the triangle formed by the lines  $ax^2 + 2hxy + by^2 = 0$ .

$$lx + my + n = 0$$
 is  $\left| \frac{n^2 \sqrt{h^2 - ab}}{am^2 - 2h/m + b/^2} \right|$ 

- 20. Find the values of K, if the lines joining the origin to the points of intersection of the curve  $2x^2 2xy + 3y^2 + 2x y 1 = 0$  and the line x + 2y = K are mutually perpendicular.
- 21. Find the angle between the lines whose direction cosines satisfy the equations l + m + n = 0,  $l^2 + m^2 - n^2 = 0$ .
- 22. Find  $\frac{dy}{dx}$ , if  $y = (\sin x)^{\log x} + x^{\sin x}$ .
- 23. Find the angle between the curves xy = 2,  $x^2 + 4y = 0$ .
- 24. A wire of length *l* is cut into two parts which are bent respectively in the form of a square and a circle. What are the lengths of the pieces of the wire respectively so that the sum of the areas is the least ?

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