



Code Number:

A**Aakash****Medical | IIT-JEE | Foundations**

Corp. Office: Aakash Educational Services Limited, 3rd Floor, Incuspaze Campus- 2, Plot No. 13,
Sector- 18, Udyog Vihar, Gurugram, Haryana - 122015

Time: 3 hrs.

Mock Test Paper for Class-XII

Max. Marks: 75

MATHEMATICS

Paper - II(B)

Roll No.

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GENERAL INSTRUCTIONS

Read the following instructions carefully and follow them:

1. The Question paper consists of section **A**, **B**, and **C**
2. Answer all the questions of **Section A**. Answer ANY **FIVE** questions out of **seven** in **Section B** and answer ANY **FIVE** questions out of **seven** "in **Section C**.
3. In **Section A**, questions from Sl. Nos. **1** to **10** are of '**very short answer type**'. Each question carries **TWO** marks. Every answer may be limited to **5** lines. Answer all the questions at one place in the same order.
4. In **Section B**, questions from Sl. Nos. **11** to **17** are of '**short answer type**'. Each question carries **Four** marks. Every answer may be limited to **20** lines. Answer any **FIVE** questions out of **7** questions.
5. In **Section C**, questions from Sl. Nos. **18** to **24** are of '**long answer type**'. Each question carries **Seven** marks. Every answer may be limited to **60** lines. Answer any **FIVE** questions out of **7** questions.
6. Draw labelled diagrams, wherever necessary for questions in **Sections B** and **C**.

SECTION - A

I. Answer ALL questions.

10 x 2 = 20

1. Find the centre and radius of the circle $\sqrt{1+m^2}(x^2+y^2) - 2cx - 2mcy = 0$
2. Find the length of the tangent from (2,5) to the circle $x^2 + y^2 - 5x + 4y + k = 0$ is $\sqrt{37}$ then find k.
3. Find the angle between the circles $x^2 + y^2 - 12x - 6y + 41 = 0$ and $x^2 + y^2 + 4x + 6y - 59 = 0$
4. Find the co-ordinates of the points on the parabola $y^2 = 8x$ whose focal distance is 10.
5. If the eccentricity of a hyperbola is $\frac{5}{4}$. then find the eccentricity of its conjugate hyperbola
6. Evaluate $\int \frac{x^8}{1+x^{18}} dx$
7. Evaluate $\int \frac{(1+x)e^x}{\cos^2 xe^x} dx$
8. Find $\int_0^2 |1-x| dx$
9. Find $\int_0^{\frac{\pi}{2}} \sin^4 x \cos^5 x dx$
10. Find the order and degree of $\left[\frac{d^2y}{dx^2} + \left(\frac{dy}{dx} \right)^3 \right] = 6y$

SECTION - B

II. Answer ANY FIVE questions.

5 x 4 = 20

11. If a point P is moving such that the lengths of the tangents drawn from P to the circles $x^2 + y^2 - 4x - 6y - 12 = 0$ and $x^2 + y^2 + 6x + 18y + 26 = 0$ are in the ratio 2:3 then find the equation of locus of P
12. If $x+y=3$ is the equation of the chord \overline{AB} of the circle $x^2 + y^2 - 2x + 4y - 8 = 0$, find the equation of the circle having \overline{AB} as diameter
13. Find the length of major axis, latus rectum, eccentricity, co-ordinates of centre ,foci and the equations of directrices of the ellipse $9x^2 + 16y^2 = 144$
14. If the normal at one end of the latus rectum of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ passes through one end of minor axis, then show that $e^4 + e^2 = 1$
15. Find the equation of the tangents to the hyperbola $3x^2 - 4y^2 = 12$ which are (i) parallel and (ii) perpendicular to the line $y=x-7$
16. Evaluate $\int_0^{\frac{\pi}{2}} \frac{dx}{4+5\cos x}$
17. Solve $(1+y^2)dx = (\tan^{-1}y - x)dy$

III. Answer ANY FIVE questions.

5 x 7 = 35

18. Find the equation of the circle whose centre lies on X-axis and passing through the points (-2,3) and (4,5)

19. Find the equation of transverse common tangents of the circles

$$x^2 + y^2 - 4x - 10y + 28 = 0, \quad x^2 + y^2 + 4x + 6y + 4 = 0$$

20. Show that the equation of the common tangents to the circles $x^2 + y^2 = 2a^2$ and the parabola

$$y^2 = 8ax \text{ are } y = \pm(x + 2a)$$

21. Evaluate $\int \frac{2\sin x + 3\cos x + 4}{3\sin x + 4\cos x + 5} dx$

22. Find the reduction formula of $\int \tan^n x dx$ for an integer $n \geq 2$ and deduce the value of $\int \tan^6 x dx$

23. Show that $\int_0^{\frac{\pi}{2}} \frac{x}{\sin x + \cos x} dx = \frac{\pi}{2\sqrt{2}} \log(\sqrt{2} + 1)$

24. Solve $\frac{dy}{dx} = \frac{y^2 - 2xy}{x^2 - xy}$



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