Time: 3 hrs.   # Mock Test Paper for Class-XII   **Max. Marks: 75**

MATHEMATICS
Paper - II(B)

Roll No.

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**.

I. ***Answer ALL questions.*** **10 x 2 = 20**

1. Find the equation of circle with centre (1, 4) and radius 5.

2. Find the value of k if the points (1, 3), (2, k) are conjugate w.r.to the circle $x^2 + y^2 = 35$.

3. Find the equation of the radical axis of the circles $2x^2 + 2y^2 + 3x + 6y - 5 = 0$,

   $3x^2 + 3y^2 - 7x + 8y - 11 = 0$.

4. Find the coordinates of the point on the parabola $y^2 = 8x$, whose focal distance is 10.

5. If the eccentricity of a hyperbola is 5/4, then find the eccentricity of its conjugate hyperbola.

6. Evaluate $\int e^x \sin e^x dx$

7. Evaluate $\int e^x (\sin x + \cos x) dx$

8. Evaluate $\int_2^3 \frac{2x \, dx}{1 + x^2}$

9. Evaluate $\int_0^{\pi/2} \sin^7 x \, dx$

10. Find the general solution of $\frac{dy}{dx} = \frac{2y}{x}$.

SECTION - B

II. ***Answer ANY FIVE questions.*** **5 x 4 = 20**

11. Find the pole of the line $x + y + 2 = 0$ w.r.t. the circle $x^2 + y^2 - 4x + 6y - 12 = 0$.

12. Find the equation and length of the common chord of the two circles $x^2 + y^2 + 2x + 2y + 1 = 0$ and $x^2 + y^2 + 4x + 3y + 2 = 0$.

13. Find the length of latus rectum, eccentricity, co-ordinates of centre and foci of the ellipse

    $9x^2 + 16y^2 = 144$.

14. Show that the locus of the feet of the perpendiculars drawn from either of the foci to any tangent to the ellipse is the auxiliary circle.

15. Find the equations 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 $\int_0^{\pi/2} \frac{\sin^5 x}{\sin^5 x + \cos^5 x} dx$.

17. Solve the differential equation $\frac{dy}{dx} + y \tan x = \cos^3 x$.

III. ***Answer ANY FIVE questions.***   **5 x 7 = 35**

18.   If (2, 0), (0, 1), (4, 5) and (0, c) are concyclic then find c

19.   Show that the circles $x^2 + y^2 - 4x - 6y - 12 = 0$ and $x^2 + y^2 + 6x + 18y + 26 = 0$ touch each other. Find the point of contact and common tangent.

20.   Show that the equation of the parabola in the standard form is $y^2 = 4ax$.

21.   Evaluate $\int \dfrac{x+1}{x^2 + 3x + 12}$.

22.   Obtain reduction formula for $I_n = \int \sin^n x\, dx$ n being a positive integer, $n \geq 2$ and deduce the value of $\int \sin^4 x\, dx$.

23.   Evaluate $\displaystyle\int_0^{\pi/4} \dfrac{\sin x + \cos x}{9 + 16 \sin 2x}\, dx$.

24.   Solve the differential equation $(x^2 + y^2)\, dx = 2xy\, dy$.

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