MS JUNIOR COLLEGE

Hyderabad

GUESS PAPER - 1

INTERMEDIATE 2nd YEAR

Time: 3hours MATHEMATICS- IIB **Max.Marks:75**

I. i) Very Short Answer Type Questions. **(10 x 2 = 20)**

ii) Answer **ALL** questions.

iii) Each question carriers **TWO** marks.

1. Find the centre and radius of the circle $\sqrt{1+m^2}\ (x^2 + y^2) - 2cx - 2mcy = 0\ (c > 0)$.
2. Find the equation of the tangent of the point 30^0 of the circle $x^2 + y^2 + 4x + 6y - 39 = 0$.
3. If the circles $x^2 + y^2 + 2gx + 2fy = 0$ and $x^2 + y^2 + 2g'x + 2f'y = 0$ touch each other then show that $f'g = fg'$.
4. Find the cordinates of the points on the parabola $y^2 = 2x$ whose focal distance is 5/2.
5. Find the equation of the hyperbola whose foci are $(\pm 5,0)$, the transverse axis is of length 8.
6. Evaluate $\int \frac{1+\cos^2 x}{1-\cos 2x}dx$.
7. Evaluate $\int \frac{e^x(1+x)}{\cos^2(xe^x)}dx$.
8. Evaluate $\int_0^{\pi} \sqrt{2+2\cos\theta}\ d\theta$.
9. Evaluate $\int_0^{2\pi} \sin^2 x \cos^4 x\ dx$.
10. Form the differential equation corresponding to $y = A\cos 3x + B\sin 3x$, where A and B are parameters.

II. i) Short Answer Type Questions. **(5 x 4 = 20)**

ii) Answer any **FIVE** questions.

iii) Each question carriers **FOUR** marks.

11. Find the length of the chord intercepted by the circle $x^2 + y^2 - x + 3y - 22 = 0$ on the line $y = x - 3$.
12. If the straight line $2x + 3y = 1$ intersects the circle $x^2 + y^2 = 4$ at the points A and B, then find the equation of the circle having AB as diameter.
13. If the normal at one end of a latus rectum of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ passes through one end of the minor axis, then show that $e^4 + e^2 = 1$.
14. Find the equations of the tangent and normal to the ellipse $9x^2 + 16y^2 = 144$ at the end of latus rectum in the first quadrant.
15. Find the equation of the hyperbola whose foci are (4, 2), (8, 2) and eccentricity is 2.
16. Evaluate $\int_{\pi/6}^{\pi/3} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}}dx$.
17. Solve: $\cos x \frac{dy}{dx} + y\sin x = \sec^2 x$.

III. i) Long Answer Type Questions. **(5 x 7 = 35)**

ii) Answer any **FIVE** questions.

iii) Each question carriers **SEVEN** marks.

18. Show that the four points (1, 2), (3, -4), (5, -6) and (19, 8) are concyclic and find the equation of the circle.

19. Find the transverse common tangents of the circles $x^2 + y^2 - 4x - 10y + 28 = 0$ and $x^2 + y^2 + 4x - 6y + 4 = 0$.

20. Show that the equations of common tangents to the circle $x^2 + y^2 = 2a^2$ and the parabola $y^2 = 8ax$ are $y = \pm(x + 2a)$.

21. Evaluate $\int \frac{\cos x + 3\sin x + 7}{\cos x + \sin x + 1} dx$.

22. Evaluate $\int \frac{2x + 3}{(x+ 3)(x^2 + 4)} dx$.

23. Find the area enclosed by the curves $y = 3x$ and $y = 6x - x^{2.}$.

24. Solve the differential equation $(2x + y + 1)\,dx + (4x + 2y - 1)\,dy = 0$.

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