

AIMSTUTORIAL.IN
model guess paper-1 - March - 2019
INTERMEDIATE II -YEAR telengana
MATHEMATICS - IIB

Time: 3hours

Max.Marks:75

INSTRUCTIONS:

1. Q.Nos: 1 - 10 are Very Short Answer Type. Each question carries 2 marks.
2. Q. Nos: 11 - 17 are Short Answer Type. Each question carries 4 marks.
3. Q.Nos: 18 - 24 are Long Answer Type. Each question carries 7 marks.

I. Very Short Type Questions: Answer ALL.

[10 x 2 = 20]

1. Find the values of a,b of $ax^2 + bxy + 3y^2 - 5x + 2y - 3 = 0$ represents a circle. Also find its radius.
2. If $ax + by + c = 0$ is the polar of (1,1) with respect to the circle $x^2 + y^2 - 2x + 2y + 1 = 0$ and H.C.F of a,b,c is equal to 1 then find $a^2 + b^2 + c^2$.
3. Find the value of k, if the circles $x^2 + y^2 + 4x + 8 = 0$ and $x^2 + y^2 - 16y + k = 0$ are orthogonal.
4. Find the coordinates of the points on the parabola $y^2 = 2x$ whose focal distance is $\frac{5}{2}$.
5. If the angle between the asymptotes of a hyperbola is 30° , then find its eccentricity.
6. Evaluate $\int \frac{1 + \cos^2 x}{1 - \cos 2x} dx$.
7. Evaluate $\int \tan^{-1} x dx$.
8. Find $\int_0^1 \frac{x^2}{1+x^2} dx$.
9. Find the area cut off between $x = 0$, $2x = y^2 - 1$.
10. Find the order and degree of the differential equation $x^{1/2} \left(\frac{d^2 y}{dx^2} \right)^{1/3} + \frac{xdy}{dx} + y = 0$.

II. Short Type Questions: Answer any FIVE.

[5 x 4 = 20]

11. Find the equation of normal at (3,-4) to the circle $x^2 + y^2 - 22x - 4y + 25 = 0$. Also find the area of triangle formed by normal with coordinate axes.
12. Find the equation of the circle whose diameter is the common chord of the circles $x^2 + y^2 + 2x + 3y + 1 = 0$, $x^2 + y^2 + 4x + 3y + 2 = 0$.
13. Find the eccentricity, foci and equations of directrices of the ellipse $4x^2 + y^2 - 8x + 2y + 1 = 0$.
14. The distance of a point on the ellipse $x^2 + 3y^2 = 6$ from the centre is 2. Find the eccentric angle of the point.
15. Find the equation of hyperbola whose foci are (4, 2) and (8, 2) and eccentricity is 2.
16. Evaluate $\lim_{n \rightarrow \infty} \frac{\sqrt{n+1} + \sqrt{n+2} + \dots + \sqrt{n+n}}{n\sqrt{n}}$.
17. Solve the differential equation $(x^2 + y^2)dy = 2xy dx$.

III. Essay Type Questions. Answer any FIVE:

[5 x 7 = 35]

18. Show that the points (1,2), (3,-4), (5,-6) and (19,8) are concyclic.
19. Find the equation of pair of tangents from (1,3) to the circle $x^2 + y^2 - 2x + 4y - 11 = 0$ and also find the angle between them.
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 $\int \frac{2x+5}{\sqrt{x^2-2x+10}} dx$.
22. Evaluate $\int \frac{\cos x + 3 \sin x + 7}{\cos x + \sin x + 1} dx$.
23. Find $\int_0^1 \frac{\log(1+x)}{1+x^2} dx$.
24. Solve $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$.