GAUTAM BUDHHA NAGAR UNIVERSITY

BSC HONS MATHEMATICS

October 2024

MAXIMUM MARKS: 100 TIME :3HRS

Read carefully before starting the test:

- Answer the questions using a blue or black pen.
- You can't use any electronic device
- mobile phones are strictly prohibited

FULL NAME: _____
ROLL NO.: _____
EXAMINER SIGNATURE: _____

1. Is it true that $x^n + y^n = z^n$ if x, y, z and n are positive integers?. Explain
2.Prove that the real part of all non-trivial zeros of the function $\zeta(z)$ is $\frac{1}{2}$
3. Compute

$$\int_0^\infty \frac{\sin(x)}{x}$$

markmarks [06]
[4]
For the curve

$$x = a(3u - u^3), \qquad y = 3au^2, \qquad z = a(3u + u^3)$$

show that

$$= k = \frac{1}{3a(1+u^2)^2}$$

[5] A curve is uniquely determined except as the position in space, when its curvature and torsion are given functions of its arc length.

[6] Show that there exists an infinite family of involutes for a gives curve.

[07] Give short answers of the following questions.

1. Define Helicoids?
2. Define spherical indicatrix?
3. Define the intrinsic equation?
4. Write the statement of existence theorem for space curve?
5. The normal curvature k_n is equal to the what?
6. Prove that $L = -n_1 \cdot r_1$ and $N = -n_2 \cdot r_2$?
7. Define the geodesic?
8. Write down the equation of tangent plane?
9. If equation of the circle is $x^2 + y^2 = a^2$ then the parametric equations of circles are forty two? [1]

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[1] all the best for your exam