

# The LNM Institute of Information Technology

## Math-II, Quiz-I: Section-B

Time: 20Minutes

Maximum Marks: 10

- **Problem 1.** Find the radius of convergence of the power series

$$\sum_{m=1}^{\infty} \frac{\alpha^m}{\pi^{\frac{m}{2}}} (x - \pi/2)^m \quad (\alpha \in \mathbb{R}).$$

- **Problem 2.** The exponentiation of a matrix is given by

$$e^A = \sum_{n=0}^{\infty} \frac{1}{n!} A^n. \text{ Let}$$

$$A = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}.$$

Find  $e^A$ .