Roll No. ------------------

**MAMT-09**

**Integral Transforms and Integral Equations**

MA/M.Sc. Mathematics (MAMT/MSCMT)

2ndYear Examination2024 (Dec.)

**TIME: 2 Hours Max Marks: 70**

Note: This paper is of Seventy (70) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.***Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.***

**SECTION – A**

**Long-answer - type questions**

**Note: Section ‘A’ contains Five (05) long-answer-type questions of Nineteen (19) marks each. Learners are required to answer any two (02) questions only. (2×19=38)**

1. If then where is a real or complex number.
2. Evaluate .
3. Define symmetric kernel and prove that every eigenvalue of a symmetric kernel is real and that every eigen function corresponding to different eigenvalues are orthogonal.
4. Solve subject to conditions; .
5. State the mellin inversion theorem.

**SECTION – B**

**Short – answer – type questions**

**Note: Section ‘B’ contains eight (08) short- answer type questions of Eight (08) marks each. *Learners are required to answer any Four (04) questions only.* (4×8=32)**

1. Find the inverse Laplace transform of
2. Solve when .
3. Find the Hankel transform of taking as the kernel.
4. Solve .
5. Define the following
6. Singular integral equation.
7. The able integral equation.
8. Integro-differential equation.
9. Integral equation of convolution type.
10. Evaluate
11. State the convolution theorem for Fourier transform.
12. Show that the function is a solution of the Fredholm equation.