ARYA COLLEGE OF ENGINEERING & I.T.

II MIDTERM EXAMINATION

SUBJECT- ENGINEERING MATHEMATICS II

B.TECH. I YEAR II SEM (COMMON TO ALL BRANCHES)

TIME: 90 MIN. **MM**: 50

NOTE:

- Attempt **all** questions. All questions carry **equal** marks.
- Answer sheet must be written in **STUDENT OWN HAND-WRITING.**
- The duration of the question paper would be **90 minutes**. An additional **15 minutes** will be given to the students for uploading the answer-sheets only in **pdf format,** on the **Google Classroom.**
- The answer-sheets uploaded after the specified duration will be rejected and not be evaluated by the examiner.

Q1. Solve by method of variation of parameters:

$$\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x log x$$

Q2. Solve in series:

$$(x - x^2)\frac{d^2y}{dx^2} + (1 - 5x)\frac{dy}{dx} - 4y = 0$$

Q3. Solve the following differential equation:

$$(D^2 + 1)^2 y = x^2 \cos x$$

Q4. Find a complete integral of:

$$pq = x^m y^n z^{2l}$$

Q5. Find the solution of the differential equation:

$$\frac{\partial u}{\partial t} = k\frac{\partial^2 u}{\partial x^2}$$

Subject to the conditions:

(i) u not infinite for $t \to \infty$,

(ii) $\frac{\partial u}{\partial x} = 0$ for $x=0$ and $x=l$

(iii) $u = lx - x^2$ for $t=0$ between $x=0$ and $x=l$.