EXPERIMENT NUMBER – 3.7

STUDENT NAME: DIVYANSH PANDEY UID: 21BCS11270

BRANCH: CSE DOP: 01/06/2022

SUBJECT: PHYSICS FOR ENGINEERS GRP: 510 B

- **AIM OF THE EXPERIMENT** – To calculate the velocity of ultrasonic sound through water media

- **APPARATUS-**

1. Ultrasonic interferometer
2. Sample liquids
3. High frequency generator

- **OBSERVATIONS-**
  1. Least count = 0.5 mm
  2. Pitch of circular scale = 0.5
  3. Least count on screw gauge = Pitch / no. of divisions
     = 0.5/50 = 0.01 mm

4. Frequency of ultrasound used (MHz) = 2 MHz
5. Medium used = water; Density = 996.458 kg/m^3
6. Here, Gain = 20
   Adjustment = 80 (Adjustment always greater than Gain)

Sr No.	Micrometer reading corresponding to maxima/minima (mm)	Distance between successive maxima/minima (d) (mm)
1.	0.4	0.63 – 0.4 = 0.23
2.	0.63	1.35 – 0.63 = 0.72
3.	1.35	1.77 – 1.35 = 0.42
4.	1.77	2.28 – 1.77 = 0.51
5.	2.28	MEAN = 0.47

- **CALCULATIONS –**

- **FORMULA USED**

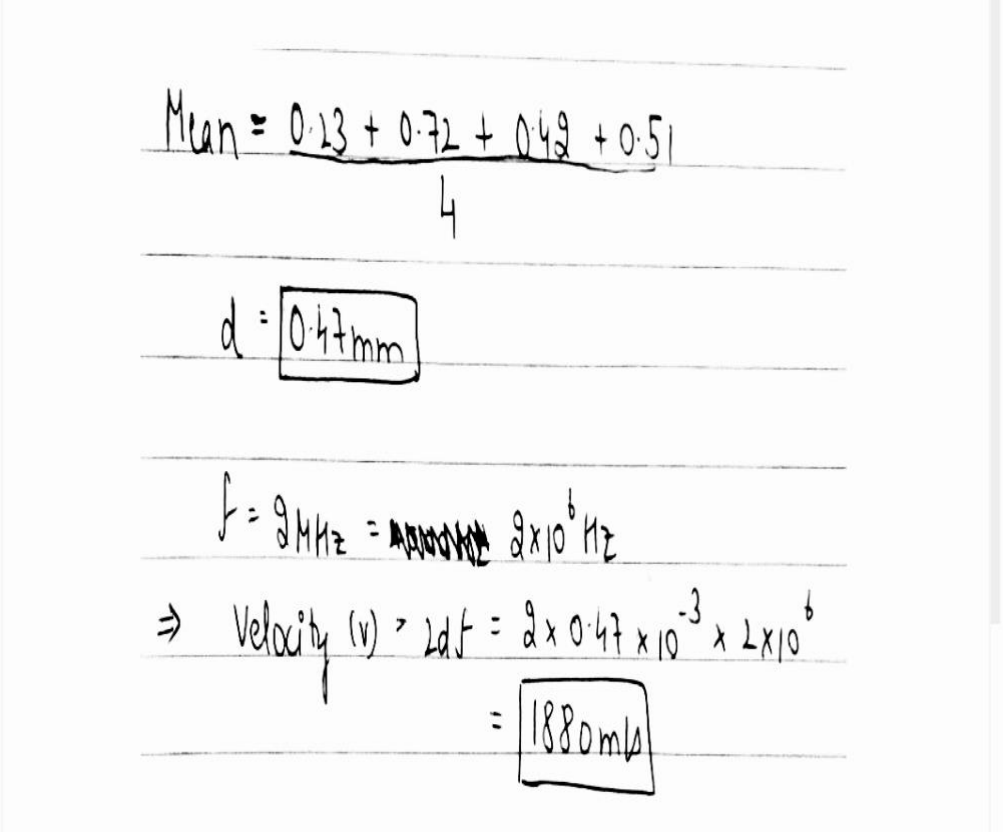
  Micrometer reading = Main scale reading + Least count * Circular scale reading

  where, least count = 0.01 mm

  Mean = Sum of readings / No. of readings

  d = λ / 2; λ = 2d

  Velocity (v) = λf = 2df



- **PERCENTAGE ERROR-**

%Age error = (Std value – Exp value) *100 / Std value
= (1480 – 1880) *100 / 1480
= 400 * 100 / 1480
= 27.07 %

- **SOURCES OF ERROR-**
  - Reading a measuring device incorrectly.
  - Not positioning the reflector correctly.
  - Loose connections.
- **RESULTS AND DISCUSSION-**
  - The calculated ultrasonic wave velocity through the given medium is 1880m/s
  - The standard value of ultrasonic wave is 1480m/s

- **LEARNING OUTCOMES**
  1. Remember the concepts related to fundamentals of C language, draw flowcharts and write algorithm/pseudocode.
  2. Understand the way of execution and debug programs in C language.
  3. Apply various constructs, loops, functions to solve mathematical and scientific problem.
  4. Analyze the dynamic behavior of memory by the use of pointers.
  5. Design and develop modular programs for real world problems using control structure and selection structure.

EVALUATION COLUMN (To be filled by concerned faculty only)

Sr. No.	Parameters	Maximu m Marks	Marks Obtaine d
1.	Worksheet Completion including writing learning objective/ Outcome	10	
2.	Post-Lab Quiz Result	5	
3.	Student engagement in Simulation/ Performance/ Pre-Lab Questions	5	
4.	Total Marks	20	