Aneesh Panchal
2K20/A6/56
17-06-2021

## EXPERIMENT - 5

### AIM:
To Determine the Mechanical Equivalent of heat.

### Observations:
Specific Heat for Al, $C_{Al}$ = 887 J/Kg $^oC$
Specific Heat for Cu, $C_{Cu}$ = 385 J/Kg $^oC$
Specific Heat for Pb, $C_{Pb}$ = 130 J/Kg $^oC$
Acceleration due to gravity, g = 9.81 m/$s^2$

| Metal | Weight m(g) | Length l(m) | Initial Temp. ($^oC$) | Flips | Final Temp. ($^oC$) | Height of shot h(m) | E = mgh (Joules) | Q = mCΔT (Joules) | J = E/Q (Joule/ Joule) |
|---|---|---|---|---|---|---|---|---|---|
| Al | 405.2 | 1.8 m | 21.1 | 45 | 22.0 | 81 | 321.976 | 323.472 | 0.9954 |
| Cu | 473.2 | 1.9 m | 21.1 | 33 | 22.7 | 62.7 | 291.059 | 291.4912 | 0.9985 |
| Pb | 515.9 | 1.9 m | 21.1 | 26 | 24.8 | 49.4 | 250.013 | 248.1497 | 1.0075 |

### Calculations:
For Al:
Value of J = 0.9954*4.186 = 4.1667444 J/Cal
Error %, $E_{Al} = \frac{4.1667444 - 4.186}{4.186} * 100 = 0.46\%$

For Cu:
Value of J = 0.9985*4.186 = 4.179721 J/Cal
Error %, $E_{Cu} = \frac{4.179721 - 4.186}{4.186} * 100 = 0.15\%$

For Pb:
Value of J = 1.0075*4.186 = 4.217395 J/Cal
Error %, $E_{Pb} = \frac{4.217395 - 4.186}{4.186} * 100 = 0.75\%$

### Results:
Mechanical Equivalents of heat for Al, Cu, Pb are 4.167 J/Cal, 4.18 J/Cal, 4.2174 J/Cal respectively with % error of 0.46%, 0.15%, 0.75% respectively.