AMERICAN UNIVERSITY OF BEIRUT

*Department of Mechanical Engineering*

## MECH-341: Materials Laboratory

## Report

## Section-4

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### Group members:

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1. Objective

The main objective of the experiment is to perform an impact tests on different type steel specimens and measuring the energy required to break a material under impact loading. Inaddition, to study the types of fracture obtained for various steel specimens at different temperatures. The specimens that will be used for testing are:

* Low Carbon steel (Tested at three different Temperatures)
* High Carbon Steel
* High Carbon Heat Treated
1. Introduction

The main objective of the impact test is to predict the likelihood of brittle fracture of a

given material under impact loading. The test involves measuring the energy consumed in breaking a notched specimen when hammered by a swinging pendulum The presence of a notch simulates the pre-existing cracks found in large structures. Note that both impact loading and the presence of a notch increase the probability of brittle fracture. The energy absorbed can be calculated by measuring the change in the potential energy of the pendulum before and after breaking the specimen (M\*g\*difference in height).

The two most commonly used impact tests, are the charpy test and the Izod test.

In the charpy test the specimen is supported as a simple-beam while in the Izod test the specimen is supported as a cantilever-beam.

1. Problem Approach
2. Analysis and Calculations

***Note: Graphs are included in the appendix section.***

1. Observations
2. Conclusion
3. References
4. Wikipedia. *www.wikipedia.org*
5. Dieter, G.E., *Mechanical metallurgy*, 1988, SI metric edition, McGraw-Hill.
6. R.C. Hibbeler, *Fundamental of materials science and engineering, 7th edition*, 2008, SI meteric edition, Prentice Hall.

1. Appendix