

**Semester: Fall 2011**

**EML3035 Affidavit Sheet**

Important: Each student is expected to work independently on the computer program. Offenders will be assigned a grade of *FF* for the whole course and brought to the attention of the Dean of academic affairs for further process. Check 2011-12 undergraduate catalog on academic dishonesty and disruption of academic process. I attest to the following.

I have

1. worked independently,
2. received no help on this programming assignment from anybody (other than instructor or TAs), and
3. given no help in completing the programming assignment

during Fall 2011 for the course - EML 3035 – Programming Concepts.

If I am found to be giving or receiving help, I will be assigned a grade of 'FF' for the whole course and brought to the attention of the Dean of Academic Affairs for further process. Check 2011-12 undergraduate catalog on academic dishonesty and disruption of academic process. You always have the right to appeal the decision of the instructor.

Name of the Project: \_\_\_\_\_

Dated \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

## IDENTIFICATION

Name: Autar Kaw (Put your name here) Section : 001 (Put Section here) Semester: Fall 2011 Due Date & Time: August 29, 2011 (Put due data and time here)

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### BACKGROUND

Title: I am hard-headed! Now how hard is my head? Background: Hardness of materials is one of the most used material selection factors. Hardness is equated with wear resistance and durability. One of the hardness tests is called the Brinell hardness test. In this case, a ball is pushed into the surface of the material, and an optical measuring device is used to measure the diameter of the resulting indentation. The diameter of the ball and indentation, and the applied force is then used calculate the Brinell hardness number (HB).

$$HB = L / \{ (\pi * D / 2) (D - \sqrt{D^2 - d^2}) \}$$

where L = load, kg D = diameter of indenter, mm d = diameter of indentation, mm

### SPECIFICATIONS

Specifications: Write a Matlab Worksheet where the values of L, D, and d, are written in the beginning of the matlab worksheet and then computes and displays the Brinell Hardness.

### INPUTS and DISPLAYING INPUTS

```
clc
L = 3000;
D = 10;
d = 7.2;
fprintf('\nThe Load Applied in kgf is L=%d',L)
fprintf('\nThe Diameter of the Indented Load in mm is D=%d',D)
fprintf('\nThe Diameter of the Indent in mm is L=%d',d)
```

```
The Load Applied in kgf is L=3000
The Diameter of the Indented Load in mm is D=10
The Diameter of the Indent in mm is L=7.200000e+000
```

### CODE

```
%Calculating the hardness using the formula
HB=L/((pi*D/2)*(D-sqrt(D^2-d^2)));
```

### DISPLAYING OUPUTS

```
fprintf('\nThe Hardness of the Material is HB=%d',HB)
```

```
The Hardness of the Material is HB=6.240841e+001
```

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