

IE-341

Section 1, CRN: 30512; Section 2, CRN: 30515; Section 3, CRN: 38299

First Semester 1433-34 H (Fall-2012) – 3(2,1,2)

HUMAN FACTORS ENGINEERING

Monday, Dec 03, 2012 (19/01/1434H)

Quiz 5 **ANSWERS**

Name: Ahmed M. El-Sherbeeney, PhD	Student Number: 4	Section: 9:00 / 10:00 / 11:00
---	----------------------	----------------------------------

Answer ALL of the following questions. [1 point each]

1. Examine the sign shown below and answer the questions to follow.

- a. What **type of sign** is this (i.e. danger / instruction / information / mandatory-action / exit)?

Danger

- b. What is the **referent** of this sign?

Danger: beware of falling rocks**This is used mainly as a traffic sign on mountainous roads.**

- c. How many **coding dimensions** are used in the sign?

3

- d. **Name** the coding dimensions in c.

1. **Color** (note, red is used to indicate danger)
2. **Geometric Shape** (triangle; used to indicate warning/danger)
3. **Graphic/drawing** (the figure of a falling rocks)

- e. Which of the dimensions mentioned above provides **high association** to the referent?

The graphic provides high association since it is readily perceived, i.e. high recognizability with no need of learning (unlike the geometric shape or color).

2. A person who has acuity of $\frac{3}{5}$ is looking at a sign from a distance of 30 ft.

a. Is this person shortsighted or farsighted?

Shortsighted (note, any acuity < 1 indicates shortsightedness)

b. Express the acuity in **Snellen** form.

$$\text{Acuity} = \frac{3}{5} = 0.6 = \frac{20}{x} \Rightarrow x = \frac{20}{0.6} = 33.3 \Rightarrow \text{Snellen Acuity} = \frac{20}{33}$$

c. What is the subtended **viewing angle** with which the person can view the sign?

$$VA = \frac{1}{\text{acuity}} = \frac{1}{0.6} = 1.667 \text{ min.}$$

d. Find the corresponding minimum sign **height** (in.) for c. [1 ft = 12 in.]

$$VA = 3438 \frac{H}{D} \Rightarrow H = VA \frac{D}{3438} = 1.667 \text{ min.} \left(\frac{30 \text{ ft}}{3438} \right) \left(\frac{12 \text{ in}}{\text{ft}} \right) = 0.175 \text{ in.}$$

e. What is the corresponding font size for d.?

$$\text{Font Size} = 0.1745 \text{ in} \left(\frac{1 \text{ pt}}{0.01 \text{ in}} \right) = 17.45 \text{ pt}$$

f. **BONUS** [1 pt.]: Express the answer in e. as a whole number.

First note that font size (pt) is usually expressed as whole number. Also note that this size represents the **smallest** legible size for the given acuity and distance. Thus, it won't "hurt" if the size is slightly larger, but **it will not** be legible if it is any smaller than this (i.e. if it is only 17 pt). Therefore, the smallest rounding of this size is **18 pt.**