



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

Wednesday, Sep 12, 2012 (25/10/1433H)

Quiz 1 ANSWERS

Name:	Student Number:	Section:
	4	9:00 / 10:00 / 11:00

Answer the following questions briefly.

1. Mention any two characteristics of human factors.

- Machines must be built to serve humans (not opp.)
- Design must take human differences into account
- Designs influence humans
- Design process must include data and calculations
- Human data must be tested scientifically
- Humans and machines are related
- NOT just check lists and guidelines
- NOT: using oneself as model for design
- NOT just common sense

See slide 5

2. Define human factors engineering in your own way.

- Human Factors Engineering is the systematic application of information about human capabilities, limitations, and characteristics to the design of objects and procedures that people use, and the environment in which they use them
- Human Factors Engineering discovers and applies information about human: behavior, abilities, limitations, and other characteristics to the design of tools, machines, systems, jobs, tasks, and environments for productive, safe, comfortable, effective human use.

See slide 4. Note, any similar answer of your own will be considered correct.

3. What is a closed-loop human machine system? Give an example.

- It is a human machine system that requires continuous control for functioning.
- Examples: car operation; bicycle; manual water dispenser; etc.

See slide 12

4. What is meant by “success ratio”? Give an example.

- Success ratio is the ratio of successes to total attempts, i.e. $SR = \frac{\text{success}}{\text{success} + \text{failure}}$
- Example: SR of ATM machine: $SR_{ATM} = \frac{\text{good transaction}}{\text{bad transaction} + \text{good transaction}}$

See slide 13

5. Calculate the reliability of a system with,

- 2 components in series
- reliability of 90% for each component

Since system is connected in series \Rightarrow

$$\begin{aligned} Rel_{sys} &= \text{product of Rel. of all components} = \prod_{i=1}^n Rel_{comp,i} \\ &= \prod_{i=1}^{n=2} (Rel_{comp} = 0.9) = 0.9^2 = 0.81 \end{aligned}$$

Thus, the reliability of the system is 81%.