**IE-341**

**Section 1, CRN: 30512/513/514**

**Section 2, CRN: 30515/516/517**

**Section 3, CRN: 46950/951/952**

**First Semester 1435-36 H (Fall-2014) – 3(2,1,2)
“HUMAN FACTORS ENGINEERING**

**Wednesday, Sep 17, 2014 (22/11/1435H)**

**Quiz 1 ANSWERS**

|  |  |  |
| --- | --- | --- |
| **Name:**  | **Student Number:****4** | **Section:****Sun / Mon / Wed** |

**Answer the following questions briefly.**

1. **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.**

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***

1. **What is an open-loop human machine system? Give an example.**
* **It is a human machine system that requires no further control (after operating).**
* **Examples: car cruise-control; RoombaTM; light switch; etc.**

***See slide 12***

1. **What is meant by “reliability”? Give an example.**
* **Reliability is the probability of successful operation.**
* **Example: Reliability of car battery:** $Rel\_{battery} =\frac{successful operations}{successful operations+unsuccessful operations}$

***See slide 14***

1. **Calculate the reliability of a system with,**
	* **2 components in parallel**
	* **reliability of 50% for each component**

Since system is connected in parallel ⇒

$$1-\left(1-Rel\_{comp,i}\right)^{n}=1-\left(1-0.50\right)^{2}=1-\left(0.50\right)^{2}=1-0.25=0.75$$

**Thus, the reliability of the system is 75%.**