

IE-341

Section 1, CRN: 30512

Section 2, CRN: 30515

First Semester 1432-33 H (Fall-2011) – 3(2,1,2)

HUMAN FACTORS ENGINEERING

Wednesday, Oct 19, 2011 (21/11/1432H)

### Quiz 3 ANSWERS

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**Answer the following questions.**

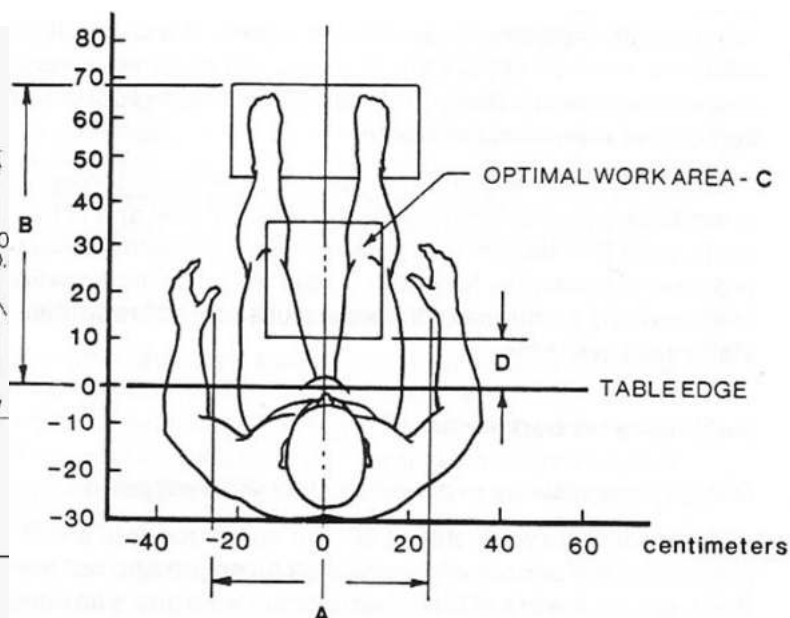
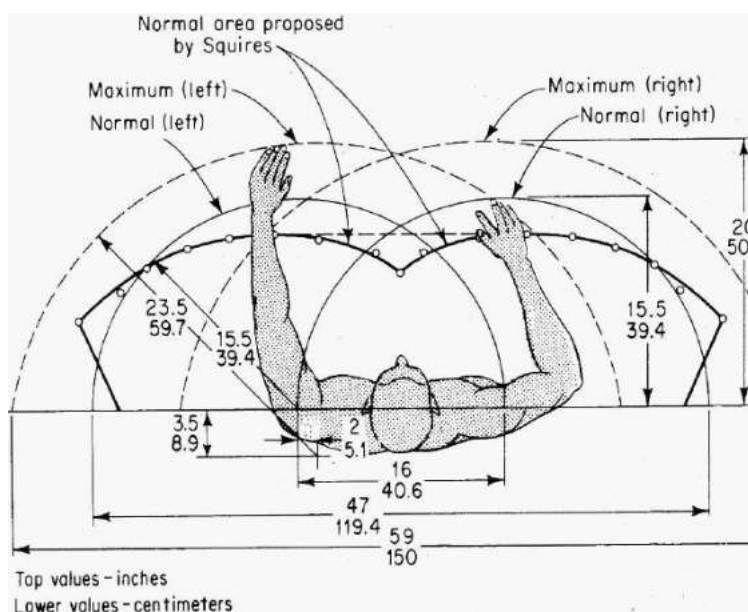
- Briefly compare (using sketches) between the research regarding horizontal work surface areas suggested by, **[4 points]**

a. Barnes and Farley (normal and maximum area)

Barnes and Farley discuss the horizontal work surface area in terms of arm movement; the *normal area* (in the figure shown below – left) describes forearm movement and *maximum area* pertains to complete arm movement.

b. Ayoub (optimum work area)

Ayoub treats the horizontal work surface area from the viewpoint of actual area (optimum work area) that he shows should be used for work, which is 25 cm by 25 cm at 10 cm from the table edge (as shown below - right).



2. Name three factors affecting seated work-surface height.[2 points]

- Arm posture
- Seat height
- Thickness of the work surface
- Thickness of the thighs

*Note, any three of the above will do.*

3. Name two principles for seated work surfaces. [2 points]

- Best to find work surfaces with adjustable height
- Best if work surface is such that elbow height = working height
- Work surface should provide enough clearance for people with thick thighs

*Note, any two of the above will do.*

4. What parts of the body are affected by the standing work-surface height being too high, and in what way are they affected?[2 points]

- Affected parts: shoulders and upper limbs
- Effect: fatigue, strain on shoulder muscles