Prince of Songkla University

The Faculty of Engineering

Midterm Examination Semester II **Academic Year: 2005**

Date: Dec 18, 05 **Time: 13:30 -15:30**

Subject: 226-443 Ergonomics **Room: R300**

225-602 Human factors engineering

ทุจริตในการสอบ โทษขั้นต่ำคือ ปรับตกในรายวิชานั้น และพักการเรียน **1** *ภาคการศึกษา*

DIRECTIONS

1. Only short note on an A4 piece (both sides), dictionary and calculator are allowed.
2. 6 questions are given on 6 pages and must be done.
3. Total score is 80.
4. Your answers could be in English or Thai.
5. Please check all questions before start working.
6. Available examination time is 2 hours.

Good Luck

Asst.Prof.Dr. Angoon Sungkhapong

1. According to Figure 1, answer the following questions.

   a) What are essential functions of skull? (5 points)

   b) What kind of joints represent in Figure 1 (A-E)? (10 points)

   c) Give me the name of bones in Figure A1-A3, C-1, and D-1 in Figure 1. (10 points)

   d) What is the outstanding characteristic of mandible bone which is different from others? (3 points)

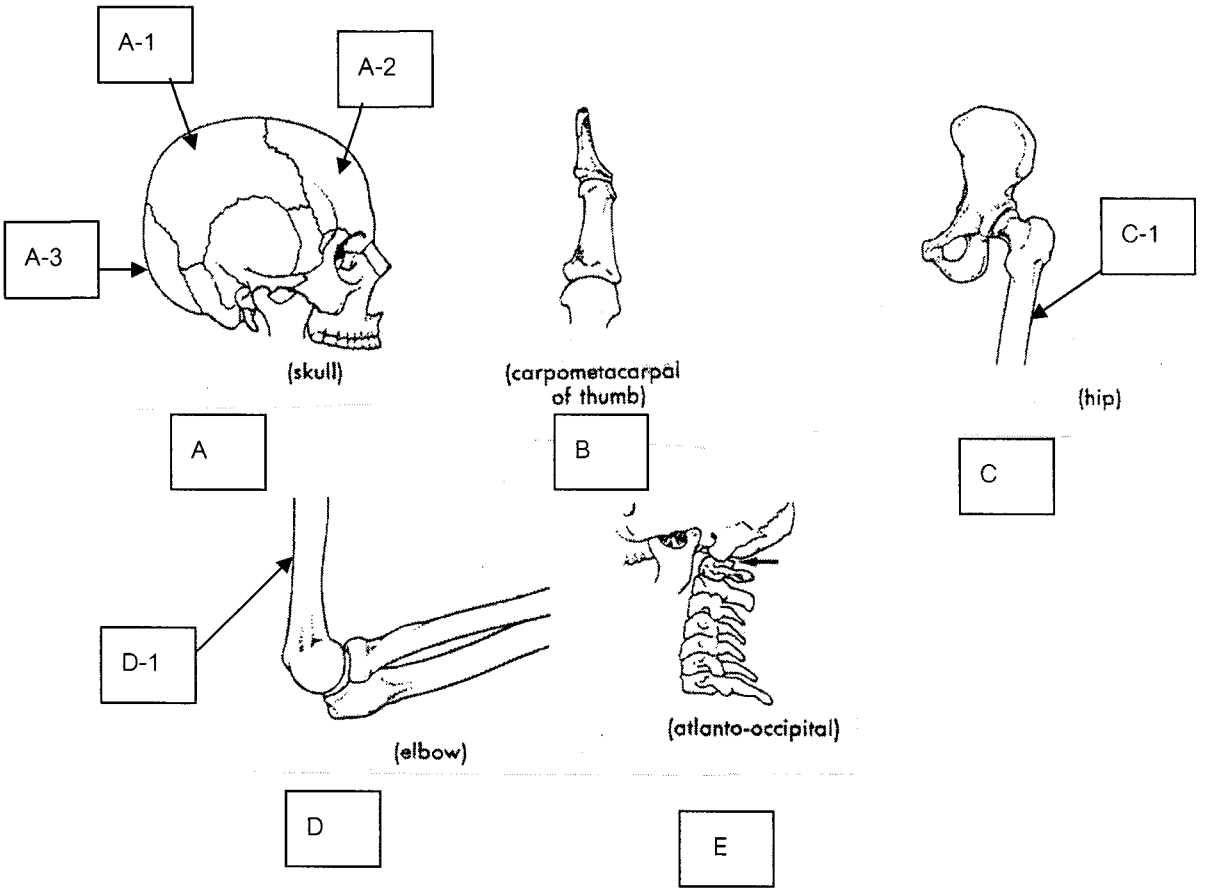

Figure 1: Show human bones and joints.

2. What type of each action (2-A to 2-F) shown in Figure 2.1 and 2.2 ?

(12 points)

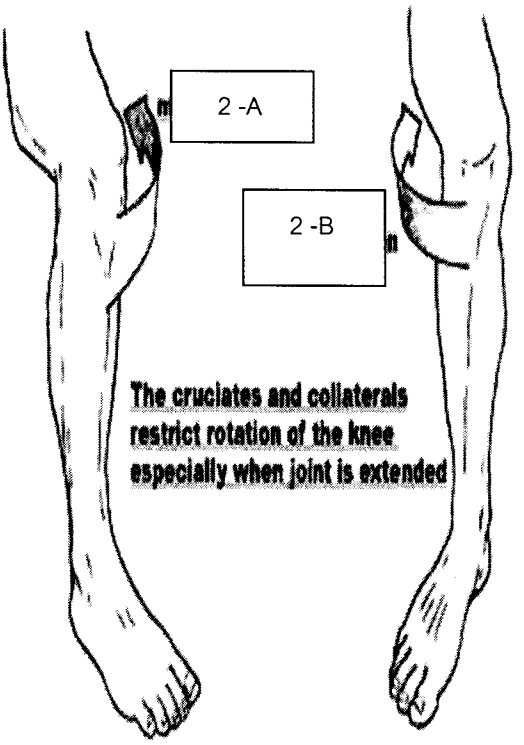

Figure 2.1: Show movements of lower limb.

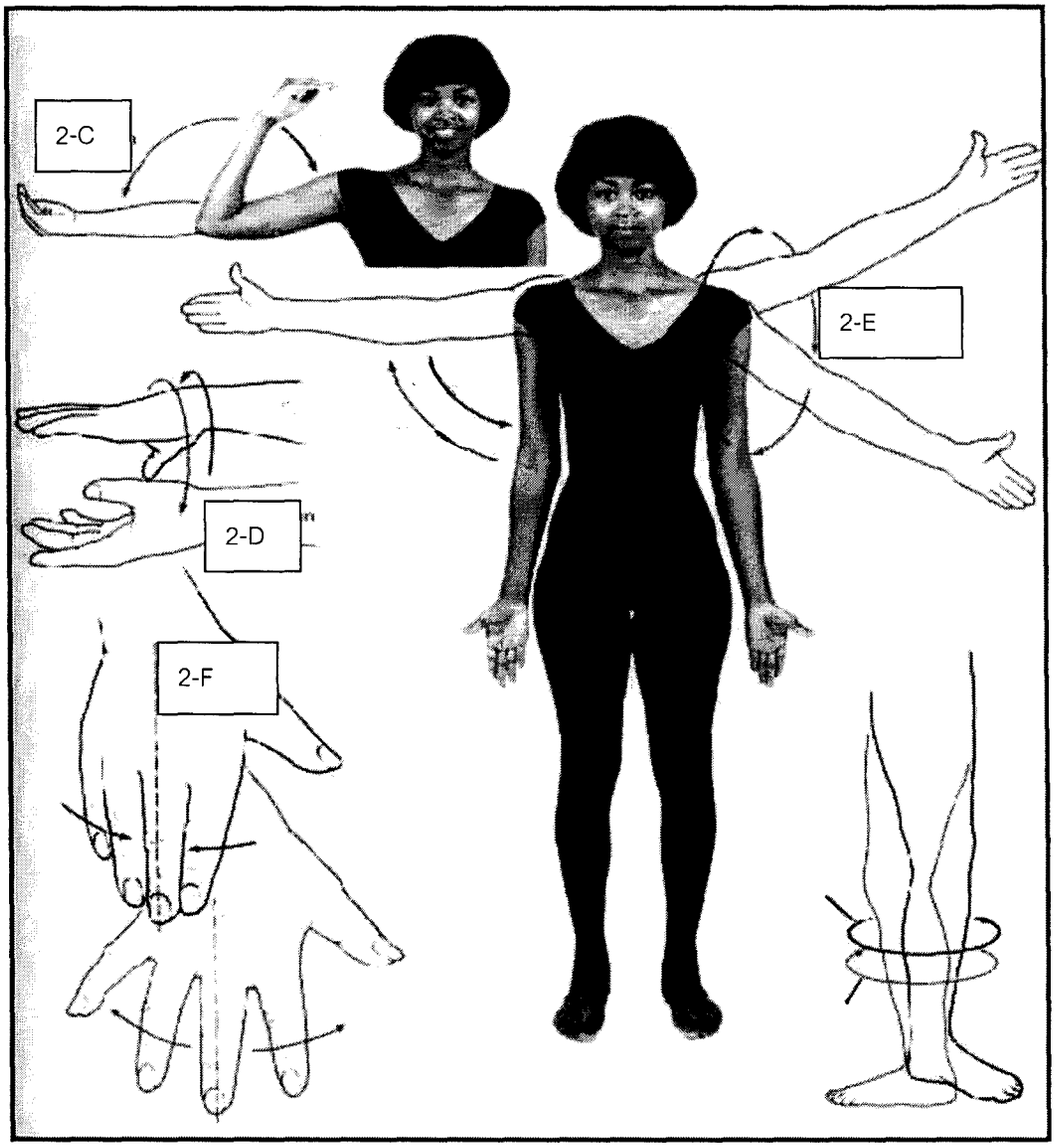

Figure 2.2: Movement in each action.

3. Explain and show the examples of light work, medium work, heavy work, static muscle effort and dynamic muscle effort. (10 points)

4. What is your recommendation for a good design of stair and slope? (5 points)

5. According to the anthropometric data shown in Table 1, determine the 90th percentile of eye height (men and women). (5 points)

Table 1: Show a set of anthropometry data (in mm.)

Dimension	Men				Women			
	5th percentile	50th percentile	95th percentile	*SD*	5th percentile	50th percentile	95th percentile	*SD*
1 Stature	1647	1755	1867	67	1528	1628	1737	64
2 Eye height	1528	1633	1743	66	1415	1515	1621	63
3 Shoulder height (acromion)	1342	1442	1546	62	1241	1332	1432	58
4 Elbow height	995	1072	1153	48	926	997	1074	45
5 Hip height (trochanter)	853	927	1009	48	789	860	938	45
6 Knuckle height	na	na	na	na	na	na	na	na
7 Fingertip height	591	653	716	40	531	610	670	36
8 Sitting height	855	914	972	36	795	851	910	35
9 Sitting eye height	735	792	848	34	685	738	794	33
10 Sitting shoulder height (acromion)	549	598	646	30	509	555	604	29
11 Sitting elbow height	184	232	274	27	176	221	264	27
12 Thigh height (thickness)	149	168	190	13	140	158	180	12
13 Buttock–knee length	569	615	667	30	542	588	640	30
14 Buttock–popliteal length	458	500	546	27	440	481	528	27
15 Knee height	514	558	606	28	474	514	560	26

na = not available

6. The workstation design as shown in Figure 3 is appropriate for sitting work.

   Do you have any suggestion or comment for this station by using concept

   theory which was discussed in class? (20 points)

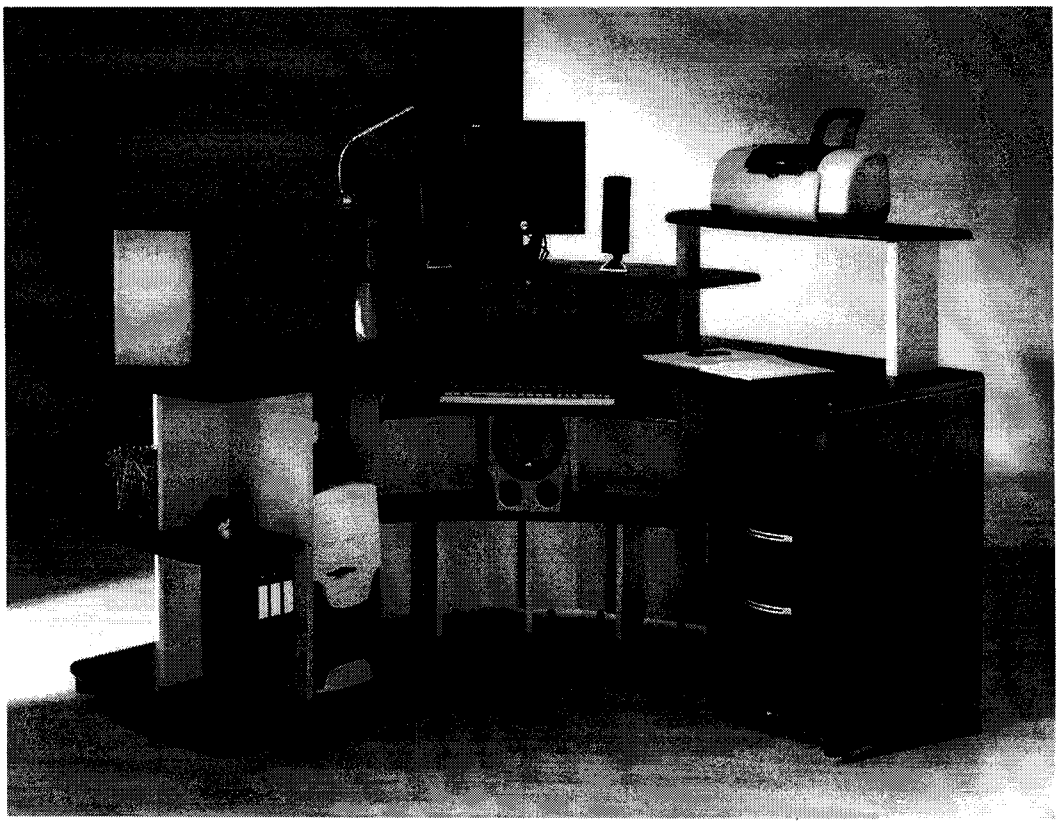

Figure 3: Workstation for sitting work.

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