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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(TAKE HOME)
SEMESTER II
SESSION 2019/2020**

COURSE NAME : ERGONOMICS &
ANTHROPOMETRICS

COURSE CODE : BPP 10202

PROGRAMME CODE : BPP

EXAMINATION DATE : JULY 2020

DURATION : 24 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS
OPEN BOOK EXAMINATION

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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TERBUKA

- Q1** Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment. The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. These droplets are too heavy to hang in the air, and quickly fall on floors or surfaces. We can be infected by breathing in the virus if we are within close proximity of someone who has COVID 19, or by touching a contaminated surface and then use our contaminated hand to touch our eyes, nose or mouth.

Further information about the virus; could refer to World Health Organization (WHO) website;

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

In order to prevent transmission of the disease, as a technical specialist on designing special space; you are required to design an appropriate space arrangement and/or furniture for either **ONE (1)** of the following areas:

- i. A dine – in restaurant
- ii. Hospital triage station
- iii. A cashier counter / station

You need to ensure all necessary prevention measures are according to WHO and Ministry of Health, Malaysia (MOH) guidelines.

- (a) Explain **TWO (2)** challenges on the existing selected area in Q1 which not fulfill WHO and MOH guidelines.
(5 marks)
- (b) Suggest **FOUR (4)** improvements or innovations on the space arrangement and/or furniture based on the challenges explained in Q1(a). You need to explain why the certain suggestions are proposed.
(10 marks)
- (c) Identify **FIVE (5)** anthropometric specifications for the selected area (including furniture and arrangement).
(5 marks)
- (d) Explain **THREE (3)** importances of the selected anthropometric specifications stated in Q1(c); you may use some sketches to help the explanation.
(5 marks)

- (e) Draw the newly-improved selected space and furniture(s) using any appropriate software such as Google SketchUp, FreeCAD, AutoCAD etc. (20 marks)
- (f) Explain **TWO (2)** advantages of the newly-improved selected space and furniture(s) in order to prevent the transmission of the disease. (5 marks)

-END OF QUESTIONS-

FINAL EXAMINATION

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Index	Data Table in SI units						Conversions to US Trad cm, kg in, lb
	Men			Women			
	Mean	-sd	+sd	Mean	-sd	+sd	
1 None:	0.0			0.0			0
2 Stature {9}	174.5	6.6	6.6	162.1	6.0	6.0	0.394
3 Weight {4-1}	83.2	15.1	15.1	66.4	13.9	13.9	2.2
4 Forward Functional Reach - Inc body depth {1a}	82.6	4.8	4.8	74.1	3.9	3.9	0.394
5 Fwd Func. Reach - acromial process to pinch {1b}	63.8	4.3	4.3	62.5	3.4	3.4	0.394
6 Fwd Func. Reach - abdomen to pinch {1c}	62.1	6.9	6.9	60.4	6.7	6.7	0.394
7 Abdominal Extension Depth {2}	23.1	2.0	2.0	20.9	2.1	2.1	0.394
8 Waist Height - Stand {3}	106.3	5.4	5.4	101.7	5.0	5.0	0.394
9 Tibial Height {4}	45.6	2.8	2.8	42.0	2.4	2.4	0.394
10 Knuckle Height - Stand {5}	75.5	4.1	4.1	71.0	4.0	4.0	0.394
11 Elbow Height - Stand {6}	110.5	4.5	4.5	102.6	4.8	4.8	0.394
12 Shoulder Height - Stand {7}	143.7	6.2	6.2	132.9	5.5	5.5	0.394
13 Eye Height - Stand {8}	164.4	6.1	6.1	151.4	5.6	5.6	0.394
14 Functional Overhead Reach - Stand {10}	209.6	8.5	8.5	199.2	8.6	8.6	0.394
15 Thigh Clearance Height - Sit {11}	14.7	1.4	1.4	12.4	1.2	1.2	0.394
16 Elbow Rest Height - Sit {12}	24.1	3.2	3.2	23.1	3.0	3.0	0.394
17 Midshoulder Height - Sit {13}	62.4	3.2	3.2	58.0	2.7	2.7	0.394
18 Eye Height - Sit {14}	78.7	3.6	3.6	73.7	3.1	3.1	0.394
19 Sitting Height - Normal {15}	86.6	3.8	3.8	81.8	4.0	4.0	0.394
20 Functional Overhead Reach - Sit {16}	128.4	8.5	8.5	119.8	6.6	6.6	0.394
21 Knee Height - Sit {17}	54.0	2.7	2.7	51.0	2.6	2.6	0.394
22 Popliteal Height - Sit {18}	44.6	2.5	2.5	41.0	1.9	1.9	0.394
23 Leg Length - Sit {19}	105.1	4.8	4.8	100.7	4.3	4.3	0.394
24 Upper-Leg Length - Sit {20}	59.4	2.8	2.8	57.4	2.6	2.6	0.394
25 Buttocks-to-Popliteal Length - Sit {21}	49.8	2.5	2.5	48.0	3.2	3.2	0.394
26 Elbow-to-Fist Length {22}	38.5	2.1	2.1	34.8	2.3	2.3	0.394
27 Upper-Arm Length {23}	36.9	1.9	1.9	34.1	2.5	2.5	0.394
28 Shoulder Breadth {24}	45.4	1.9	1.9	39.0	2.1	2.1	0.394
29 Hip Breadth {25}	35.6	2.3	2.3	38.0	2.6	2.6	0.394
30 Foot Length {26}	26.8	1.3	1.3	24.1	1.1	1.1	0.394
31 Foot Breadth {27}	10.0	0.6	0.6	8.9	0.5	0.5	0.394
32 Hand Thickness, Metacarpal III {28}	3.3	0.2	0.2	2.8	0.2	0.2	0.394
33 Hand Length {29}	19.0	1.0	1.0	18.4	1.0	1.0	0.394
34 Digit Two Length {30}	7.5	0.7	0.7	6.9	0.8	0.8	0.394
35 Hand Breadth {31}	8.7	0.5	0.5	7.7	0.5	0.5	0.394
36 Digit One Length {32}	12.7	1.1	1.1	11.0	1.0	1.0	0.394
37 Breadth of Digit One Interphalangeal Joint {33}	2.3	0.1	0.1	1.9	0.1	0.1	0.394
38 Breadth of Digit Three Interphalangeal Joint {34}	1.8	0.1	0.1	1.5	0.1	0.1	0.394
39 Grip Breadth, Inside Diameter {35}	4.9	0.6	0.6	4.3	0.3	0.3	0.394
40 Hand Spread, D1 to D2, 1st Phal. Joint {36}	12.4	2.4	2.4	9.9	1.7	1.7	0.394
41 Hand Spread, D1 to D2, 2nd Phal. Joint {37}	10.5	1.7	1.7	8.1	1.7	1.7	0.394
42 Head Breadth {38}	15.3	0.6	0.6	14.5	0.6	0.6	0.394
43 Interpupillary Breadth {39}	6.1	0.4	0.4	5.8	0.4	0.4	0.394
44 Biocular Breadth {40}	9.2	0.5	0.5	9.0	0.5	0.5	0.394
45 Blank	1.0	1.0	1.0	1.0	1.0	1.0	1

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 v2.1 1/8/06 © 2006 Thomas E. Bernard

Anthropometrics Table



FINAL EXAMINATION

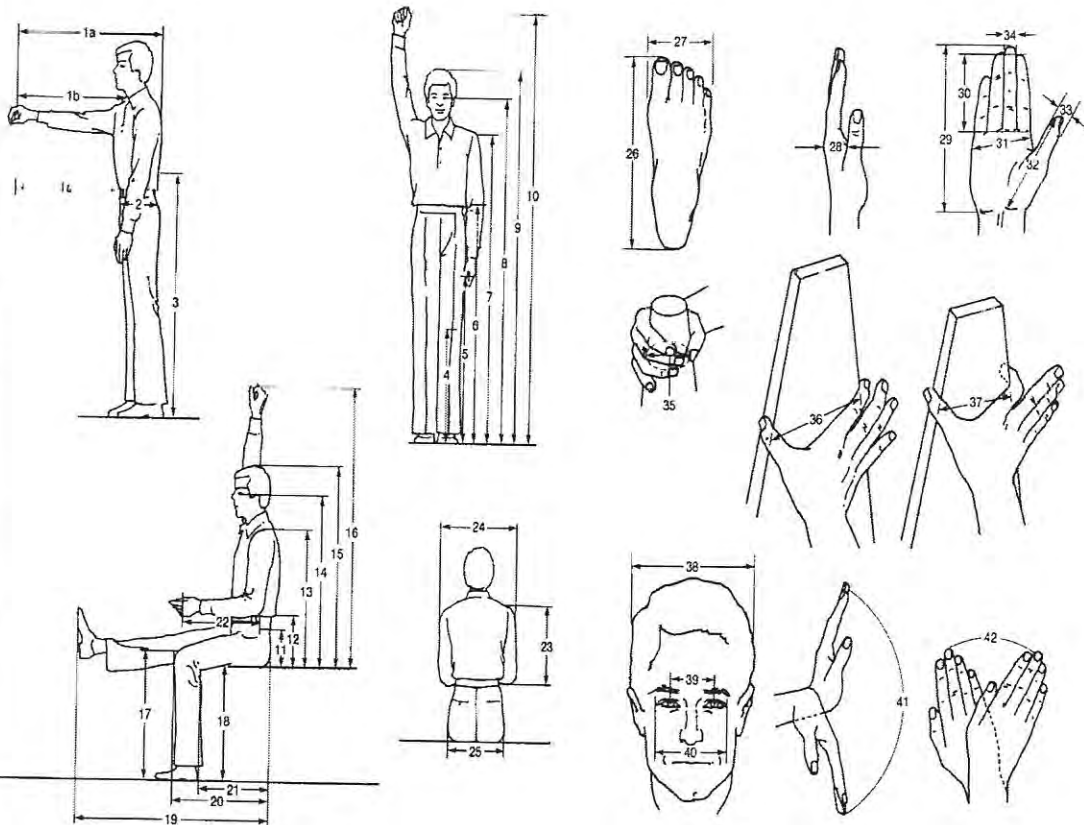
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Location References and Data Source

Information from Kodak's *Ergonomic Design for People at Work, 2nd Ed*
S. N. Chengalur, S. H. Rodgers, T. E. Bernard (ed)
John Wiley and Sons 2004
<http://www.wiley.com/WileyCDA/Wiley/III/II/productCd-04/1418033.html>

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Anthropometrics Location References