Total number of printed pages = 4

19/2nd Sem/PCSE 213

2022

HUMAN COMPUTER INTERACTION

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Define Usability. 3

   (b) Briefly discuss the five "E" s of Usability. 10

   (c) Is there any difference between Software Engineering and Usability Engineering ? 4

   (d) What is Participatory design ? 3

2. (a) With example discuss – 10

   (i) Balance,

   (ii) Unity,

   (iii) Proportion and

   (iv) Rule of Thirds.

[Turn over

(b) 'Aesthetics of an interface is subjective in nature'. – Justify. 5

(c) Compare low fidelity prototype with high fidelity prototype. 5

3. (a) Consider a case when you are typing your assignment using any word processor. You need to import a picture from your "download" folder and paste it in your document. Once it is done you start writing your assignment. What will be the operators if we use KLM method ? How much time is required to complete this task ? 10

(b) Consider you have touch screen mobile. You want to open an app which is 2 cm away from your present position of index finger. The icon width of the app is 0.5 cm. Compute the index of difficulty using Fitt's Law. It has been observed that 1 second is required to move your index finger. What will be the throughput ? 10

4. (a) Write down the Nielsen's ten heuristics for usability. 6

(b) Consider any mobile application / web page. Use Nielsen's heuristic to find out at least seven usability problems. 14

5. Consider, you have designed an eye-gaze based typing. A sample text was typed by five users. They also performed the same with the standard key board (hardware) and virtual key board. All the tasks completion times are given in the following table. Use 1D ANOVA to prove the efficacy of your keyboard with the confidence level 5%. 20

User #	Eye-gaze (seconds)	Standard Keyboard (seconds)	Virtual Keyboard (seconds)
1	5	8	4
2	3	7	7
3	4	6	8
4	5	3	5
5	1	9	4

F table

Critical values of F for the 0.05 significance level :

	1	2	3	4	5	6	7	8	9	10
1	161.45	199.50	215.71	224.58	230.16	233.99	236.77	238.88	240.54	241.88
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.39	19.40
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79
4	7.71	6.94	6.59	6.39	6.26	6.1 6	6.09	6.04	6.00	5.96
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14
10	4.97	4,10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98
11	4.84	3.98	3.59	3.36	3.20	3.10	3.01	2.95	2.90	2.85
12	4.75	3.89	3.49	3.26	3.11	3,00	2.91	2.85	2.80	2.75
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49
17	4.45	3.59	3.20	2.97	2.81	2.70	2.61	2.55	2.49	2.45
18	4.41	3.56	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35
21	4.33	3.47	3.07	2.84	2.69	2.57	2.49	2.42	2.37	2.32
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.38	2.32	2.28
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.26
25	4.24	3.39	2.99	2.76	2.60	2.49	2.41	2.34	2.28	2.24
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18

6. (a) What are the problems in Hierarchical Task Modelling ? 5

(b) Design a CTT for writing messages using our mobile phone. 15