



BITS F364

Human Computer Interaction

End-Semester Examination

Max. Marks: 80

Date: 22nd December, 2022

Max. Duration: 180 minutes

Name: _____ ID: _____

- Hoping all of you used one of the indoor navigation systems developed during the course to find your examination room :)
- Answer all questions.
- **Write your name and ID number in ink at the top of the first sheet and also in all subsequent sheets. Please make sure that these are legible.**
- You are allowed to bring 2 A4 sheets, hand-written on both sides in a non-black ink, to the examination, for reference. **Write your name and ID number on the top of your reference sheet before the examination begins.** You are not allowed to exchange the sheets with others before or during the examination. **Violation of any of these conditions will be treated as a case of unfair means and will be dealt with accordingly.** You are free to take the reference sheets with you at the end of the examination.
- Please note that you will be given credit for original thinking and analysis. Merely reproducing content from the slides used in class will not fetch any credit.
- **You are allowed to carry non-programmable calculators to the exam.** No other electronic or communication devices are allowed. **Borrowing or exchange of calculators are not allowed during the exam.**
- This question-cum answer booklet comprises 10 printed pages and 9 questions.
- **Answers to all questions in this examination must be written in this booklet itself, in the designated space after each question. No additional sheets can be attached to this booklet.**
- Units, wherever necessary, must be mentioned in the answers. All necessary working must be shown in the answer space itself.
- Only answers written in ink (not in pencil) will be evaluated.
- Write legibly. The examiners will be free to make assumptions if they can not read your answers.

Question:	1	2	3	4	5	6	7	8	9	Total
Points:	0	14	10	12	6	15	8	8	7	80
Score:										

1. **(0 marks)** Read each instruction in the box above and tick-mark them as you read them.
2. Answer the following questions. *Please remember merely reproducing terms and phrases from the lectures will not fetch any credit.*
 - (a) **(3 marks)** The mobile interface in Figure 1 is divided into three zones. Label the zones as Easy, Medium and Hard in terms of Usability for a right-handed user considering Fitt's law. (Write the labels on the figure itself.)

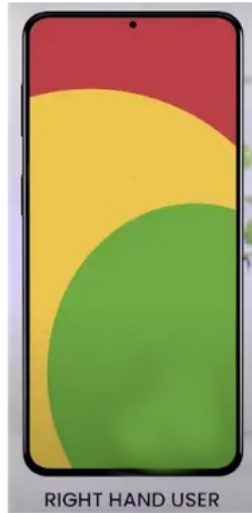


Figure 1: Figure for Question 2 (a)

- (b) **(5 marks)** You have been tasked with designing an e-commerce website. Which laws of UX will you keep in consideration while designing the website and how?

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- (c) **(3 marks)** You realise that several users coming to the above website are first time users of e-commerce. What design modifications will you do in order to make it easy for these users to use your website?

- (d) **(3 marks)** You realise that several users for the above website are adding items to their 'cart' but not completing the purchase. How would you use Selenium to determine the lacunae in the user flow?

3. (a) **(5 marks)** Analyse the BITS ERP interface in terms of the *Attributes of Usability*.

- (b) **(2 marks)** More *Learnable* systems tend to be less *Efficient*. Do you agree? How would you reconcile the statement for an interface designed for novice and expert users?

- (c) **(3 marks)** You have been tasked with analysing the memorability of an ATM machine. Design an experiment to execute this task. How would you analyse the results?

4. (a) **(4 marks)** Evaluate the Task load index from the response to a NASA TLX questionnaire given in Figure 2. Show your working.

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Name	Task	Date
<p>Mental Demand How mentally demanding was the task?</p> <p>Very Low Very High</p>		
<p>Physical Demand How physically demanding was the task?</p> <p>Very Low Very High</p>		
<p>Temporal Demand How hurried or rushed was the pace of the task?</p> <p>Very Low Very High</p>		
<p>Performance How successful were you in accomplishing what you were asked to do?</p> <p>Perfect Failure</p>		
<p>Effort How hard did you have to work to accomplish your level of performance?</p> <p>Very Low Very High</p>		
<p>Frustration How insecure, discouraged, irritated, stressed, and annoyed were you?</p> <p>Very Low Very High</p>		

Figure 2: Figure for Question 4 (a)

(b) (4 marks) Evaluate the usability of the system from the SUS response given in Figure 3. Show your working.

The System Usability Scale Standard Version		Strongly Disagree						Strongly Agree
		1	2	3	4	5		
1	I think that I would like to use this system frequently.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
2	I found the system unnecessarily complex.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
3	I thought the system was easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>		
4	I think that I would need the support of a technical person to be able to use this system.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
5	I found the various functions in this system were well integrated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>		
6	I thought there was too much inconsistency in this system.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
7	I would imagine that most people would learn to use this system very quickly.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		
8	I found the system very awkward to use.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
9	I felt very confident using the system.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
10	I needed to learn a lot of things before I could get going with this system.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>		

Figure 3: Figure for Question 4 (b)

(c) (2 marks) What is/are some drawback(s) of using NASA TLX and SUS to measure usability?

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(d) **(2 marks)** Map the questions in the SUS questionnaire to the different attributes of usability.

5. (a) **(2 marks)** Interpret the following Munsell scale notation: 5YR 6/12.

(b) **(4 marks)** You are designing a mobile app and you have the option to finalise the colour scheme from a few choices. Design a user experiment you would use to decide the final colour scheme. How would you analyse the results?

6. (a) **(10 marks)** Classify the following errors. Mention a design solution for each which might prevent these errors:

i. Wrongly registering a course on the ERP

ii. Using Reply-All instead of Reply in an email interface

iii. Pressing the wrong floor button in a lift

iv. Knocking on the door of the wrong professor in the H block

v. Forgetting to switch the gas oven off after finishing cooking

(b) **(5 marks)** You have been tasked with designing the layout for a medical device. The device requires two power sources, one supplying 5 ampere and the other supplying 15 ampere of AC, using a wrong supply can damage the device. The device has 5 buttons, two of which are to increase or decrease the dosage of medicine being administered to the patient. Suggest design solutions to error-proof the system.

7. **(8 marks)** Analyse your examination room against the principles of Universal Design. Mention which room number you are writing the exam in. If the room falls short in some of the principles, what design changes would you suggest to improve it?

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8. (a) **(5 marks)** Certain mobile apps subtly nudge users towards behaviour that lead to profits for the app-maker. From your experience describe an app which leads you into a behaviour of low-productivity (and profit for the app-maker). What design solutions will you recommend to counter the influence that the app has on you.
- (b) **(3 marks)** Suggest design innovations for a currency note so that they are usable by users who are visually challenged and numerically illiterate.

9. (a) **(5 marks)** Describe one bad design, outside the BPHC campus, that you frequently encounter. What design changes would you make to this design? Feel free to draw free-hand diagrams to explain better.

(b) **(2 marks)** What is the most important take-away for you from this course. How do you plan to use it in your daily life?