



DES201T: Systems Thinking for Design

Online End-Semester Examination (30 Marks)

5 Dec 2020 - (Deadline for Online submission: 13:00 hrs)

Note for the students:

1. Your responses may be converted to PDF and Uploaded in the form:
https://docs.google.com/forms/d/1ddH9znFuPovCfDHStvYMnhZh_QcXHu60sbNFLveQcw0/edit
2. In case of no access to computer, responses may be written on A4 sheets, scanned using mobile, and emailed.
3. Ensure that filename is as follows: DES201T-RollNo.

Part-A: Short Answers using Tables/Diagrams (3X5 = 15 marks)

1. Consider movie as a product. Pick one that you think is good and one that you think is bad.
 - a. Explain the difference in terms of the key elements of the product specification, i.e., what is its form, function, expected behavior, structure, content, medium, process? Use a Tabular format and highlight the key differences (3 marks)
 - b. Map the relationships among the key elements. Explain what difference do you see in the relationship among the elements in the two movies? (2 marks)
2. MakeMyTrip (MMT), which lost 90% of its revenue during lockdown, has started seeing a growth in travel demand. They call it “revenge travel”, i.e., people wanting to get out of their homes for short vacations of different types to breakout of lockdown blues. Similarly, festivals such as Diwali have seen large crowds throng shopping places with little regard for social distancing or other protocols. MMT management is seriously concerned that this kind of revenge travel or shopping without following protocols could increase the infection rate and lead to the next round of lockdown (which has already happened in parts of North India). While MMT sees a silver lining in this pattern, they are desperately betting on the vaccine to bale them out in the long-term. Draw a model of the above scenario and highlight the systems principle behind it (5 marks).
3. How well have you participated in your assignment?
 - a. Identify the primary stakeholder from your assignment, list atleast two important needs, one alterable and one constraint. Frame three different objectives using these (each objective should have one clear meaning) and identify the most relevant one for the situation (3 marks).
 - b. Draw a SysML Requirements model of your product concept (2 marks). It must have atleast two levels of hierarchy and must be derived from the most appropriate objective identified from stakeholder analysis.



Part-B: Detailed Answer (1X15=15 marks)

4. Given below is a client problem scenario. Read the scenario and provide a detailed answer. Your response should not exceed 4 pages.

Damini is a second-year engineering student in Lucky Institute of Technology. She was preparing for her end semester exam in the stressful pandemic situation. She was not able to concentrate nor remember anything. She took out her mobile phone and started chatting with her friend. While chatting an idea occurred to her. She thought what if she could design a solution that will help her transfer the content in the book into her brain and also reduce anxiety simultaneously (much like how Aamir Khan holds the hand of someone to learn vocabulary in the movie PK). She thought that if she could combine machine vision with Brain Computing Interface, then she could potentially capture the content and transfer it to the brain. She was so excited by the idea that she started Googling. And very quickly found that some researchers were using the same combination of technologies to help military personnel detect underground mines or patients with memory loss. She felt excited that if she could design a product, then she could launch a startup. After the exams she did some research on the technologies, but after doing some trial and error she realized that it may not be feasible for her to implement the idea as she did not have sufficient knowledge or skills. She was dejected. At that time, her dad suggested that it may be better if she could speak to someone who had some understanding of product design. She immediately remembered that you were learning product design and sought your help. As a budding design-engineer who has just been exposed to a course called Systems Thinking for Design and New Product Development, how would you try to help Damini? Your responses must be based on the concepts you have learnt in the course and not general gyan.

- a. How would you use your understanding of (i) the relationships between science, technology, product, and business; (ii) the fuzzy front-end; and (iii) the problem-solving process; to help Damini explore the idea and not give up quickly due to lack of knowledge of the technology/application or its complexity? (5 marks)
- b. Assuming she has gained sufficient confidence to pursue the idea, how would you guide her in translating the idea (requirement) into a product? List the important steps in transforming the requirement to a product specification using the F-B-S model (2 marks)? Illustrate with some sample functions for the above requirement. Discuss what kind of creativity is possible in each step? (8 marks)