



## **DS2000: Systems Thinking for Design**

### **Online End-Semester Examination (40 Marks)**

**24 Nov 2021 - (Deadline for Online submission: 12:30 hrs)**

#### Note for the students:

1. Your responses may be converted to PDF and uploaded in the form:  
<https://forms.gle/ZkQtH1VCxoE5vgf7A>
2. In case of no access to computer, responses may be written on A4 sheets, scanned using mobile, and uploaded to the google form link.
3. Ensure that filename is as follows: DS2000-RollNo. (Use caps when writing Roll no.)

### **Part-A: Fill in the blanks (10 X 1 = 10 Marks)**

1. Phase I of the make in India happened in the Indian IT industry from the year \_\_\_\_\_ to \_\_\_\_\_
2. Name one key expectation from industry from a fresher who is just starting their career.
3. A real-world problem has the following
  - i. Unambiguity
  - ii. Uncertainty
  - iii. Inter-dependency
  - iv. Multi-disciplinaryAnswer true or false with a brief justification.
4. \_\_\_\_\_ is the content for music and \_\_\_\_\_ is the process for music. (Answer considering elements of a product)
5. Simplification should eliminate \_\_\_\_\_ complexity, not \_\_\_\_\_ complexity
6. Transitive is a type of relation in which two parts are related through a \_\_\_\_\_ part
7. Complexity is the result of interactions among \_\_\_\_\_
8. \_\_\_\_\_ feedback is deviance amplifying
9. in-degree is the total 1s in a \_\_\_\_\_
10. In the experiment conducted by Milagram in 1967, he found that that average number of links was \_\_\_\_\_

**Part-B: Short Answers using Tables/Diagrams (3X5 = 15 marks) Think and answer in brief (< 1 page).**

1. Consider any one product of your choice. 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. 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? Identify the primary stakeholder from your assignment, list at least 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 (5 marks).

**Part-C: (1X15=15 marks), Think long and answer in detail (< 4 pages) – you could use additional sheets for capturing your thoughts. Apply the learning from relevant courses.**

1. Suppose that you are invited by the Mayor of Chennai corporation to address a design challenge “To design a low-cost driver assistance solution for reducing accidents involving a garbage truck of Chennai corporation” in a timeframe of 12 weeks. How would you approach this problem situation?
  - a. Would you carry out an elaborate discovery or only diagnosis? If so, why? What would you expect to derive at the end of your diagnosis? (4 marks)
  - b. How would you realize the physical solution after diagnosis? Define a sample functional hierarchy and trace the transformation to the physical solution. (6 marks)
  - c. What are the two key steps in this transformation? What kind of creativity is possible in each step? Illustrate using the above requirement. (5 marks)