

LEAN OPERATIONS AND SUPPLY CHAIN MANAGEMENT

(22WSD203)

Semester 2 2023

In Person Examination

This examination is to take place in-person at a central University venue under exam conditions. The standard length of time for this paper is **2 hours**

You will not be able to leave the exam hall for the first 30 or final 15 minutes of your exam. Your invigilator will collect your exam paper when you have finished.

Help during the exam

Invigilators are not able to answer queries about the content of your exam paper. Instead, please make a note of your query in your answer script to be considered during the marking process.

If you feel unwell, please raise your hand so that an invigilator can assist you.

Answer **QUESTION ONE AND ANY OTHER THREE** questions.

Questions carry the marks shown.

Begin the answer to each question on a new page.

Any University-approved calculator is permitted.

1.

- (a) Why are systems thinking and systematic thinking important in creating and analysing lean operations and supply chains? [10 marks]
- (b) Discuss four risk management approaches based on the probability/likelihood of the risks materialising and the potential impacts/consequence on manufacturing businesses. Use the Likelihood-Consequence matrix to locate the strategies. [10 marks]
- (c) Accurately name five contributors to lean thinking; and state at least one contribution that each of them made that is still relevant in the modern lean manufacturing methodology. [10 marks]

2.

- (a) Lean thinking abhors wastes. Briefly describe eight wastes in lean manufacturing. [8 marks]
- (b) Zinet Prime Services Ltd has five staff in its Assembly Department. Assume that you are responsible for scheduling work pattern and that you have established the number of staff required to meet customers' demand per week. The staff are Walter, John, Michael, Paul and Cheryl. The department works every day of the week throughout the year. Each staff must work 5 days in a week and have 2 days off. All staff must work on Tuesdays, Wednesdays, and Thursdays. Only Walter and John cannot work on Monday and Sunday while Michael prefers not to work on Saturday and Sunday. Paul and Cheryl prefer on to work on Friday and Saturday.
 - i. Schedule one week staff requirements that can be rolled over every week using the above details. [5 marks]
 - ii. State the number of staff that are required each day of the week. [5 marks]
 - iii. If two persons called in sick 2 hours before start time on a certain Sunday, what would you do to ensure that sufficient staff are available? [2 marks]

3.

- (a) List ten supply chain risks associated with food manufacturing. [10 marks]
- (b) State ten differences between supply chain characteristics of a stable product and an evolving product. [10 marks]

4.

- (a) Describe five applications of visual management as a lean technique. [10 marks]
- (b) Discuss the implications of configuration, location and long-term capacity when making strategic network design decisions. [10 marks]

5.

- (a) Name and explain the five steps of the theory of constraint, using your choice of example [10 marks]
- (b) Explain how three types of the buffer management (Inventory, Capacity and Time buffers) and the way they can be used in managing variations and disruptions in the manufacturing projects. Use examples and graphs. [10 marks]

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