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# P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Industrial and Production Engineering

Semester End Examination; May / June - 2019

## Lean Manufacturing System

Time: 3 hrs

Max. Marks: 100

**Note:** Answer **FIVE** full questions, selecting **ONE** full question from each unit.

### UNIT - I

- 1 a. What is Lean? Describe its virtue of Necessity. 6
- b. Explain systems and systems thinking with the help of system model. 8
- c. Compare Lean with conventional thinking. 6
- 2 a. Discuss eight different kinds of muda. 10
- b. What is TPM? Explain the following : 10
  - i) How TPM shifts maintenance tasks? (ii) Important key measures of machine performance.

### UNIT - II

- 3 a. What is standardized work? Why standardized work? List the pre requisites for standardized work. 12
- b. Explain the man power reduction using balance charts. 8
4. Illustrate the following Lean tools with example : 10
  - i) 5S system                      ii) Ishikawa diagram 10

### UNIT - III

- 5 a. Define Job rotation. Explain the types of Job rotation with example. 8
- b. Discuss the role of Quality control circle activities to reduce work force and increase worker morale. 12
- 6 a. Summarize the six Kanban rules adopted during Kanban implementation. 12
- b. Enumerate the importance of production leveling responding to changes in customer demand. 8

### UNIT - IV

- 7 a. Briefly explain the procedure for reducing setup time with sketch. 13
- b. Describe Jidoka concept. List its applications. 7
- 8 a. "Poka-Yoke reduce worker's physical and mental burden". Comment. 10
- b. Enumerate the Poka-Yoke detection methods. 10

### UNIT - V

- 9 a. Explain the following activities to supporting involvement : 12
  - i) Kaizen circle activity                      ii) Practical Kaizen training
- b. Explain the phases of hoshin planning. 8
10. Illustrate the application of Lean manufacturing related to production in any industry by means of case studies. 20