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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 - 2018**

**Lean Manufacturing System**

*Time: 3 hrs*

*Max. Marks: 100*

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

### UNIT - I

- 1a. What are the salient features of Mass Production? Briefly explain the origin and need for lean production systems. 10
- b. Explain the problems and challenges faced by Toyota Motor company and strategies used to improve the system. 10
- 2a. Discuss the basic image of lean production and differentiate between the conventional and Toyota/ Lean Model. 10
- b. Explain the characteristics of a system and the concept of systems thinking with an example. 10

### UNIT - II

- 3 a. Explain the key benefits of standardized work and its elements. 10
- b. What are 5S principles in lean system and explain how it can be used to improve the system? 10
- 4 a. What are the common layouts and their salient features? 6
- b. What is Value Stream Mapping (VSM)? Write the symbols used for VSM. 8
- c. What are the guidelines for layout and equipment? Briefly explain. 6

### UNIT - III

- 5 a. What is JIT? Explain the needs, benefits and rules of JIT production system. 8
- b. What is Kanban and the information in the Kanban? Explain production and withdrawal Kanban formats. 6
- c. Explain any two Kanban rules. 6
- 6 a. What is job rotation and explain its importance. 6
- b. What are the two kinds of conveyance and its characteristics features? 6
- c. Discuss production levelling and its benefits. What are the options to adjust to ever- changing customer demand? 8

### UNIT - IV

- 7 a. What is setup time? Explain the different methods of reducing setup time. 8
- b. Explain the three paths to Poka-Yoke. 6
- c. What is Jidoka? How is this achieved? 6

- 8 a. What is Poka-Yoke? Write the common errors with their order of importance. 6
- b. Explain the concept of Zone control. 6
- c. Discuss the following :
- i) Judgement Inspections 8
- ii) Informative Inspections

**UNIT - V**

- 9 a. Discuss the weakness of conventional planning and briefly explain the four kinds of planning in modern organization. 8
- b. Explain the Hoshin Planning Process and PDCA with an example. 12
- 10 a. List the four phases of Hoshin Planning and explain the activities in each phase. 10
- b. Discuss the implementation of Lean systems taking a suitable case study. 10

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