

Reg. No.

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B.E / B.TECH. DEGREE EXAMINATION, MAY 2023

Seventh Semester

ME18015 – LEAN SIX SIGMA*(Mechanical Engineering)***(Regulation 2018 / Regulation 2018A)****TIME: 3 HOURS****MAX. MARKS: 100**

- CO 1** The students will apply lean Manufacturing concepts and related tools in industrial cases for eliminating the wastes
- CO 2** The students will apply the lean metrics and develop current value stream mapping for 135 the system and with lean assessments it will be evaluated.
- CO 3** The students will elucidate six sigma principles, tools and its techniques. Also will develop steps to incorporate them
- CO 4** The students will apply and experiment the implementation of define, measure and analyze phases of six sigma methods in any given system.
- CO 5** The students will apply and analyze the improve and control phases of six sigma in any given system.

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

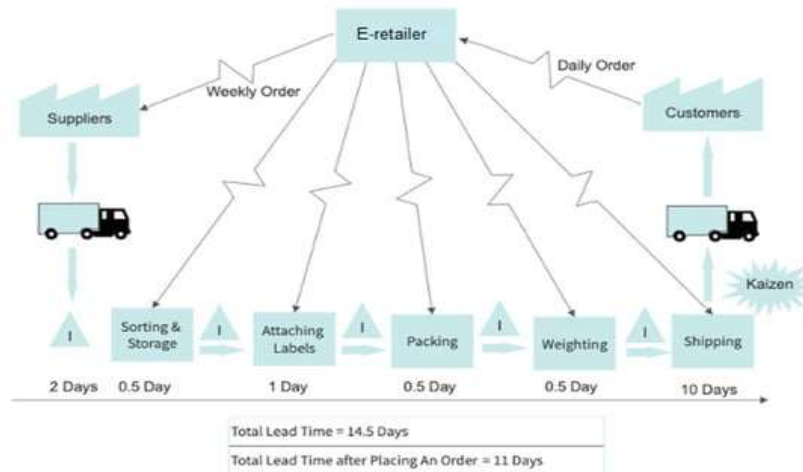
	CO	RBT LEVEL
1. How does the concept of lean evolved from traditional manufacturing?	1	2
2. What is the role of customer need in lean manufacturing?	1	3
3. How does Kaizen cloud identification helps VSM?	2	3
4. Why benchmarking is necessary and list its significance.	2	2
5. Cost of poor quality is cost lost in quality? - Explain.	3	2
6. What significance does VOC delivers to construction to QFD.	3	2
7. List few statistical software used in industrial applications for analyzing data.	4	2
8. Statistical Test and Tables comes under which DMAIC phase and why?	4	2
9. Explain the concept of cost/benefit analysis and its significance.	5	2
10. Brief about significance of using Design of Experiments (DoE) in industries.	5	2

PART- B (5 x 14 = 70 Marks)

	Marks	CO	RBT LEVEL
11. (a) Identify different lean metrics used in a manufacturing industry. Brief about how Muda & Mura helps them to improve production efficiency.	(14)	1	3
(OR)			
(b) Illustrate the concept of kaizen and stages of incorporation within the system of car parking in a theater.	(14)	1	3

12. (a) Current state VSM of an e-commerce industry is shown.

(14) 2 3



Analyze possible scope for improvement in the value chain and prepare a Future state VSM for the same.

(OR)

(b) Illustrate the impact of lean assessment in a tool manufacturing industry and how benchmarking of standards helps them in improving their target. (14) 2 3

13. (a) (i) Brief about the Kano model with respect to the product – Electric Kettle (7) 3 3

(ii) Explain about SIPOC with an example of your own choice (7) 3 3

(OR)

(b) Construct house of quality using QFD for design & development of smart watches. (14) 3 3

14. (a) Describe the procedure involved in survival analysis and explain its significance in healthcare (14) 4 3

(OR)

(b) With a simple example for each, explain in detail about 1. Cause and effect diagram 2. Histograms (14) 4 3

15. (a) Apply DMADV (or) DFSS for a glass manufacturing industry which is looking for productivity improvement through lean six sigma. (14) 5 3

(OR)

(b) Prepare key indicators for hand brake failure in cars and elucidate it with the failure mode effective analysis chart. (14) 5 3

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

	Marks	CO	RBT LEVEL
16. 'Push vs Pull system'- which is better for a mobile manufacturing company when introducing new models into the market? Justify.	(10)	1	5
