



B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2014)

Sixth Semester

MECHANICAL ENGINEERING

U14METE61: Lean Manufacturing

COURSE OUTCOMES

- CO1:** Explain various concepts of lean manufacturing
CO2: Discuss lean manufacturing tools and methodologies
CO3: Describe group technology and Just in time manufacturing process
CO4: Draw value stream mapping for given manufacturing setup
CO5: Implementation tools in lean manufacturing

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Matching type item with multiple choice code

CO1 [K1]

List I		List II	
A. ABC inventory		i. Masaaki Imai	
B. Muda		ii. Vilfredo pareto	
C. Six sigma		iii. Suzaki	
D. Poka Yoke		iv. Shingeo sheo	

- | | A | B | C | D |
|----|-----|----|-----|----|
| a) | ii | i | iii | iv |
| b) | iii | iv | ii | i |
| c) | ii | iv | iii | i |
| d) | iii | i | ii | iv |

2. A system which sets target levels for holding number of units of each product at all times is

CO1 [K1]

- | | |
|----------------------|---------------------|
| a) Make to stock | b) Make to order |
| c) Assemble to order | d) Make to assemble |

3. Which of the statements are true? CO1 [K2]

1. Overall equipment effectiveness was developed in 1960's by Seiichi Nakajima
2. Lean six sigma was first pronounced in the year 2002.
3. The founder of Toyota production systems was Sakichi Toyoda
4. QatS stands for Quality at Source

- a) 1,3 b) 1,2,3,4
c) 1,2,3 d) 2,3

4. Goods in transit between facilities can be named as CO2 [K1]

- a) Work in process inventories b) Pipeline inventories
c) Raw material inventories d) Finished goods inventories

5. Matching type item with multiple choice code CO3 [K2]

List I	List II
A. Manufacturing technique of parts having similarities in geometry and manufacturing process at a single location	i. Kaizen
B. Creating an environment where workers have an impact on decisions and actions	ii. Group technology
C. Medical science of machines	iii. Total productive maintenance
D. Change for better	iv. Worker involvement

- A B C D
- a) ii i iii iv
b) iii iv ii i
c) ii iv iii i
d) iii i ii iv

6. The list of all materials and component parts needed to make each item produced in the factory is called as CO3 [K2]

- a) Material requirement planning b) Manufacturing resources planning
c) Bill of material d) Inventory status record

7. The perfect sequence in 5S with the following rudiments is CO4 [K2]
 1. SEITON 2. SEIKETSU 3. SEISO 4. SEIRI 5. SHITSUKE
- a) 2-3-4-1-5 b) 1-5-3-2-4
 c) 3-4-5-2-1 d) 4-1-3-2-5
8. When all jobs have same route and visit each machine only once, the system is called as CO4 [K2]
 a) Batch shop b) Job shop
 c) Reentrant shop d) Flow shop
9. Assertion (A): Lean Manufacturing is the best possible systematic approach towards waste elimination CO5 [K2]
 Reason (R): Global competition is forcing firms to improve quality and reduce delivery times at lower costs
- a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
 c) A is true but R is false d) A is false but R is true
10. Bottle necks are otherwise called as CO5 [K2]
 a) Capacity constrained resources b) Limited resources
 c) Capacity unutilized resources d) Unutilized capacity resources

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. Spell objectives of lean manufacturing. CO1 [K1]
12. Outline the characteristics of pull production. CO1 [K2]
13. What is changeover time? CO2 [K1]
14. Organize the role of visual controls in lean orientation. CO2 [K3]
15. What are part families? CO3 [K1]
16. List the limitations of JIT systems. CO3 [K1]
17. Classify the types of Kanban systems. CO4 [K2]
18. Recall a mathematical expression of line balancing. CO4 [K1]
19. List the roles of senior management in lean implementation. CO5 [K1]
20. List a few organizations which have successfully implemented lean concepts. CO5 [K1]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

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|---|-----|------|
| 21. Compare traditional manufacturing with lean manufacturing highlighting the pros and cons. | CO1 | [K2] |
| 22. Categorize the major kinds of waste in manufacturing with suitable examples. | CO1 | [K4] |
| 23. Extend the role of standard work concepts and the necessity of its communication to employees in mass production. | CO2 | [K2] |
| 24. Outline concepts of production flow analysis in industrial applications. | CO3 | [K2] |
| 25. Dissect the elements of JIT systems as classical pull systems. | CO3 | [K4] |
| 26. Model future state map of value stream mapping and its application to factory simulation scenarios. | CO4 | [K3] |
| 27. Build the roadmap towards lean implementation practices accentuating on liable hurdles. | CO5 | [K3] |
