

Register No.: ..... Name: .....

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FIFTH SEMESTER B. TECH DEGREE EXAMINATION (S), FEBRUARY 2023****MECHANICAL ENGINEERING****(2020 SCHEME)****Course Code : 20MET305****Course Name: Industrial and Systems Engineering****Max. Marks : 100****Duration: 3 Hours****PART A*****(Answer all questions. Each question carries 3 marks)***

1. What are the fields of applications of industrial engineering?
2. What is the significance of prototype in product development?
3. Enumerate any six principles of Material Handling.
4. Differentiate between P system and Q system with neat sketches
5. List different methods of eliminating industrial fatigue
6. What is meant by collective bargaining?
7. How can we manage people in Agile organization?
8. List the various approaches to enhance ability in manufacturing.
9. What is OLAP?
10. What is Customer Relationship Management?

**PART B*****(Answer one full question from each module, each question carries 14 marks)*****MODULE I**

11. The fixed costs at Company X are ₹1,000,000 annually. The main product has revenue of ₹8.90 per unit and ₹4.50 variable cost. (14)
- (i) Determine the breakeven quantity per year, and
  - (ii) Annual profit if 200000 units are sold.

**OR**

12. a) Explain 'Break-even analysis' with a neat sketch, clearly explaining the terms involved in it. Derive a mathematical expression for break-even quantity. (7)
- b) Explain the following: (7)
- (i) Standardization
  - (ii) Simplification and
  - (iii) Diversification.

**MODULE II**

13. a) What are the opposing costs in inventory control? Represent them with a neat sketch, showing the total cost curve. Derive the expression for EOQ. (7)
- b) List any four factors which favour 'Make' decision and 'Buy' Decision. (7)

**OR**

14. a) The 'Company Y' estimates its carrying cost at 15% and its ordering cost at ₹9 per order. The estimated annual requirement is 48,000 units at a price of ₹4 per unit. Calculate: (7)
- (i) What is the most economical number of units to order?  
 (ii) How many orders should be placed in a year?  
 (iii) How often should an order be placed?
- b) Explain (7)
- (i) Any three Material Handling Equipment (MHE)  
 (ii) The concept of Just In Time (JIT) Manufacturing system

**MODULE III**

15. a) List and write short notes on the seven objectives of Trade union. (7)
- b) Explain different causes of Industrial Disputes (7)

**OR**

16. a) Explain different personal protective equipment with suitable examples. (7)
- b) Describe the various methods of settling industrial disputes. (7)

**MODULE IV**

17. Describe the seven types of wastes of Lean Manufacturing, with suitable examples. (14)

**OR**

18. a) Explain the stages of '5S' philosophy. (7)
- b) Illustrate and describe the conceptual framework of agile manufacturing. (7)

**MODULE V**

19. a) Explain the concept of 'Business Intelligence' (7)
- b) Describe the concept and stages of Business Process Reengineering (BPR) (7)

**OR**

20. a) What is ERP? List any seven benefits of ERP implementation. (7)
- b) Describe the concept of Supply Chain Management (SCM) and Product life cycle management (PLC) (7)

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