Question Paper Code | **13437**

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Seventh Semester

Mechanical Engineering

20MUOE908 - INTRODUCTION TO INDUSTRIAL ENGINEERING

Regulations - 2020

Duration: 3 Hours　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K-Level	CO
1.	When did trade unionism grow extensively?	1	K1	CO1
	(a) 1920　　(b) 1930　　　　(c) 1940　　　　　　(d) 1950			
2.	What is the main focus of Production Management?	1	K1	CO1
	(a) Designing new products　　(b) Directing human efforts in a production environment			
	(c) Managing financial operations (d) Controlling marketing strategies			
3.	Which one of the statement is correct onproduct layout?	1	K1	CO2
	(a) Layout for multiple product lines　　　(b) Layout based on machine grouping			
	(c) Layout in a sequence of operations　　(d) Layout for irregular products			
4.	Explain the purpose of providing storage space in a plant layout.	1	K2	CO2
	(a) To store marketing materials only　　　(b) To reduce production rates			
	(c) To support inventory and material handling　(d) To increase idle time			
5.	Identify the ideal position of the worktable relative to the worker's elbow.	1	K1	CO3
	(a) 100 mm above the elbow level　　　(b) 50 mm below the elbow level			
	(c) Same height as the elbow　　　　　(d) 200 mm below the elbow			
6.	Choose the correct definition of anthropometry.	1	K1	CO3
	(a) Study of financial trends　　　　　(b) Study of communication skills			
	(c) Study of human body dimensions　　(d) Study of software systems			
7.	Select the measure that occurs most frequently in a data set.	1	K1	CO4
	(a) Median　　　(b) Mean　　　(c) Mode　　　(d) Average			
8.	What does the Operating Characteristic (O.C.) curve illustrate?	1	K1	CO4
	(a) Control limits			
	(b) Relationship between process mean and standard deviation			
	(c) Probability of accepting a lot for various quality levels			
	(d) Number of defects in a sample			
9.	Choose the correct characteristic of a Gantt chart.	1	K1	CO5
	(a) Shows critical paths　　　　　　(b) Uses pie diagrams for process flow			
	(c) Displays tasks on a timeline　　(d) Schedules raw material delivery			
10.	What is the main objective of loading in production planning?	1	K1	CO5
	(a) To increase product cost　　　(b) To assign jobs to machines			
	(c) To maintain safety stock　　　(d) To determine wages			

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K-Level	CO
11.	Explain the concepts of industrial engineering.	2	K2	CO1
12.	Draw the layout of the input and output model of productivity.	2	K2	CO1
13.	Differentiate labour productivity and energy productivity.	2	K2	CO1
14.	Classify the types of plant layout.	2	K2	CO2
15.	Define flow pattern.	2	K1	CO2
16.	Name the different development stages of a layout.	2	K1	CO2
17.	List the need for work system design.	2	K1	CO3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create　　**13437**

| | | 2 | K1 | CO3 |
18. Draw the following therblig symbols: (i) find, (ii) search.

19. Write the limitations of control charts for attributes.   *2* *K1* *CO4*

20. Define acceptance sampling.   *2* *K1* *CO4*

21. Explain the process planning.   *2* *K2* *CO5*

22. List the stages of control of production.   *2* *K1* *CO5*

PART - C (6 × 11 = 66 Marks)
Answer ALL Questions

23. a) Illustrate the roles of industrial engineers and list the applications of industrial engineering.   *11* *K2* *CO1*

OR

   b) Explain the various factors affecting productivity in an industrial organization.   *11* *K2* *CO1*

24. a) Outline the principles of plant layout and list the objectives of good plant layout.   *11* *K2* *CO2*

OR

   b) Explain the line balancing and explain any method to solve the line balancing problem.   *11* *K2* *CO2*

25. a) Identify the various steps involved in the method study procedure and explain them.   *11* *K3* *CO3*

OR

   b) Determine the steps to derive the sample size in work measurement and to calculate the standard time in work sampling.   *11* *K3* *CO3*

26. a) The following data are obtained from an automatic filling process of a certain chemical delivered into each container. The specification of the mass delivered is 50±4 grams. Samples of 5 are taken from 10 successive samples as shown in the Table.   *11* *K3* *CO4*

	Samples									
Observation	1	2	3	4	5	6	7	8	9	10
	51	52	51	48	53	51	52	54	53	50
	50	53	52	49	49	49	54	52	53	52
	52	52	52	52	49	49	51	51	52	52
	49	54	51	49	54	50	53	53	54	53

Determine the control limit for $\bar{X}$ chart.

OR

   b) Compare and contrast the double sampling plan and over single sampling plan.   *11* *K3* *CO4*

27. a) Classify the different types of forecasting techniques and explain anyone.   *11* *K3* *CO5*

OR

   b) The annual demand for an item is 3200 units. The unit cost is Rs6, and inventory carrying charges are estimated as 25% per annum. If the cost of one procurement is Rs150, determine: *11* *K3* *CO5*
   (i) Economic order quantity,
   (ii) Number of orders per year,
   (iii) Time between two consecutive orders, and
   (iv) Optimal cost.

28. a) (i) Summarize the following terms: standard deviation (σ) and Variance (σ^2).   *6* *K2* *CO4*
   (ii) Explain the characteristics of mass production.   *5* *K2* *CO5*

OR

   b) (i) Classify the types of O.C. curve and explain.   *6* *K2* *CO4*
   (ii) Illustrate the factors affecting the scheduling.   *5* *K2* *CO5*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13437**