Reg. No.																

Question Paper Code	14342

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2026

Seventh Semester

Mechanical Engineering

20MUOE908 – INTRODUCTION TO INDUSTRIAL ENGINEERING

Regulations - 2020

Duration: 3 Hours **Max. Marks: 100**

PART – A (i) (MCQ)
(16 × 1 = 16 Marks)
Answer ALL Questions

		Marks	*K – Level*	*CO*
1	Define Industrial Engineering.	*1*	*K1*	*CO1*
	a) Science of machine design	b) Science of integrating men, machines, materials and methods for productivity		
	c) Branch of civil engineering	d) Study of chemical processes		
2	State the correct formula for Productivity.	*1*	*K1*	*CO1*
	a) Input / Output	b) Output / Input		
	c) Output x Input	d) Output - Input		
3	Name the production system model that shows resources going in and goods coming out.	*1*	*K1*	*CO1*
	a) Network model	b) Simulation model		
	c) Input-Output model	d) Queuing model		
4	What is the main objective of a good Plant Layout.	*1*	*K1*	*CO2*
	a) Increase idle time	b) Minimise material handling		
	c) Reduce number of workers	d) Increase floor space		
5	Name the layout in which machines performing similar work are placed together.	*1*	*K1*	*CO2*
	a) Product layout	b) Fixed position layout		
	c) Process layout	d) Cellular layout		
6	Which type of layout is best suited for mass production of a standard product.	*1*	*K1*	*CO2*
	a) Fixed position layout	b) Process layout		
	c) Product (line) layout	d) Combination layout		
7	Define Method Study.	*1*	*K1*	*CO3*
	a) Fixing wage rates for workers	b) Systematic recording and examination of ways of doing work to find improvements		
	c) Planning machine maintenance schedules	d) Measuring raw material consumption		
8	Infer which of the following is a Work Measurement technique.	*1*	*K2*	*CO3*
	a) Plant location survey	b) Line balancing		
	c) Stop-watch Time Study	d) Control chart		

9	Relate what Ergonomics deals with in a work system.	*1*	*K2*	*CO3*
	a) Machine cost analysis	b) Fitting the work environment to the worker for safety and comfort		
	c) Measuring production output	d) Setting quality standards		
10	Name the control chart used to monitor variation in measured values of a product.	*1*	*K1*	*CO4*
	a) p-chart	b) c-chart		
	c) np-chart	d) X-bar chart		
11	Define Acceptance Sampling.	*1*	*K1*	*CO4*
	a) Testing every item in a batch	b) Accepting all incoming lots without check		
	c) Deciding to accept or reject a lot by inspecting a sample from it	d) Reprocessing all rejected items		
12	Contrast between a Single Sampling Plan and a Double Sampling Plan.	*1*	*K2*	*CO4*
	a) Both use the same number of samples	b) Single plan inspects one sample; double plan may inspect a second sample before a decision		
	c) Double plan always rejects the lot	d) Single plan uses two samples		
13	State the full form of EBQ.	*1*	*K1*	*CO5*
	a) Economic Batch Quantity	b) Estimated Batch Quality		
	c) Effective Batch Quota	d) Extended Batch Queue		
14	Explain the main purpose of Forecasting in production planning.	*1*	*K2*	*CO5*
	a) To maintain wage records	b) To estimate future demand so that production can be planned in advance		
	c) To inspect finished products	d) To control machine breakdowns		
15	Describe what "Loading" means in Production Planning and Control.	*1*	*K2*	*CO5*
	a) Moving raw materials to stores	b) Preparing a quality inspection report		
	c) Assigning specific jobs to machines or work centres	d) Recording daily attendance of workers		
16	Illustrate which type of production is best suited for making a variety of products in small quantities.	*1*	*K2*	*CO5*
	a) Mass production	b) Continuous production		
	c) Job-shop production	d) Flow production		

PART – A (ii) (Short Answer Questions)
(8 × 3 = 24 Marks)
Answer ALL Questions

17	Explain the roles and functions of an Industrial Engineer in a manufacturing organization.	*3*	*K2*	*CO1*
18	Illustrate the Input-Output model of a Production System with a neat labelled diagram.	*3*	*K2*	*CO1*
19	Explain any four factors that influence the selection of a plant location.	*3*	*K2*	*CO2*
20	Build the steps involved in the Method Study procedure with a simple example.	*3*	*K3*	*CO2*
21	Experiment with any five Principles of Motion Economy are applied to improve a manual work task.	*3*	*K3*	*CO3*
22	Make use of the concept of Statistical Quality Control and the purpose of control charts.	*3*	*K3*	*CO4*

23	Build the Operating Characteristic (OC) curve with a neat sketch.		*3*	*K3*	*CO4*
24	Build the steps involved in Process Planning of a manufacturing organization.		*3*	*K3*	*CO5*

PART - B (Descriptive Answer Questions)

(5 × 12 = 60 Marks)

Answer ALL Questions

25.	a)	Develop the history and development of Industrial Engineering. State the major contributions of F.W. Taylor to Scientific Management and explain how they helped improve industrial productivity.	*12*	*K3*	*CO1*
		OR			
	b)	Construct the Input-Output model of a Production System. Name the different factors that affect Productivity and explain any three practical methods used to increase the productivity of workers in an organization.	*12*	*K3*	*CO1*
26.	a)	Identify the different types of Plant Layouts with neat sketches. Describe the principles of a good Plant Layout and explain the step-by-step procedure followed while designing a new plant layout for a manufacturing unit.	*12*	*K3*	*CO2*
		OR			
	b)	Develop the objectives of Plant Layout and describe the factors that affect it. Illustrate the Line Balancing concept with a neat diagram and explain any two methods used to achieve balanced production lines in an assembly shop.	*12*	*K3*	*CO2*
27.	a)	Build the objectives and procedure of Method Study. Use the ECRS principle to show how an existing manual work method can be improved. Sketch a two-hand process chart to illustrate the before and after improvement of a simple assembly task.	*12*	*K3*	*CO3*
		OR			
	b)	Experiment with the procedure of Stop-watch Time Study step by step. Describe how Standard Time is determined from observed time. Also explain any three areas of application of Ergonomics in the design of a workplace with neat sketches.	*12*	*K3*	*CO3*
28.	a)	Develop the concept of Statistical Process Control. Describe the construction and use of X-bar chart and R-chart with neat sketches. State the rules used to identify whether a process is in control or out of control from a control chart.	*12*	*K3*	*CO4*
		OR			
	b)	Model Acceptance Sampling , the Single Sampling Plan and Double Sampling Plan with neat flow diagrams. Illustrate the OC curve with a sketch and explain how the curve changes when the sample size is increased.	*12*	*K3*	*CO4*
29.	a)	Plan any two Forecasting techniques used in Production Planning and the steps involved in each method. Show with the help of a diagram how forecasting fits into the overall Production Planning and Control cycle.	*12*	*K3*	*CO5*
		OR			
	b)	Organize the concept of Economic Batch Quantity (EBQ) and derive its formula elaborating the steps of Process Planning and explain the functions of Loading, Scheduling, and Dispatching in a Production Planning and Control system with a neat block diagram.	*12*	*K3*	*CO5*