

Code No: R1941031

R19

Set No. 1

IV B. Tech I Semester Regular Examinations, November – 2022
INDUSTRIAL MANAGEMENT
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

UNIT-I

- 1 a) “Theory X and Theory Y are concerned with the nature of people”. [7]
How does the job situation affect the application of this theory? What are its implications?
- b) Write the differences between production management and industrial [8]
engineering in detail.
- (OR)
- 2 a) What are the basic elements of hierarchical need approach? What are [7]
the effects of these elements on the management style?
- b) Explain briefly the Fayol’s principles of management. [8]

UNIT-II

- 3 a) What facilities would influence (both favorable and/or unfavorable) the [7]
location decisions in the following cases:
i) city/urban sites,
ii) sub-urban sites, and
iii) rural/countryside sites.
- b) Design the best suitable layout plan for a cool drink/ beverage bottling [8]
factory. (assume the data and required operations arbitrarily).
- (OR)
- 4 a) What are the pros and cons of using the location factor analysis method [7]
for location planning? Do you have any recommendations on how to use this method for location planning?
- b) What are the different types of layouts? How should an organization [8]
decide on which layout to choose?

UNIT-III

- 5 a) Enumerate the steps involved in basic work study procedure. [7]
- b) A job has been subdivided into 4 elements. The time for each element [8]
and respective ratings are given below: Calculate the normal time and standard time for each element and for the job if allowance is 5%.

Element no.	Observed time	Rating factor (%)
1	0.6	100
2	1	80
3	1.2	130
4	1.5	90



(OR)

- 6 a) Explain different charts and diagrams which are used in method study? [7]
 b) What are therbligs symbols? Why they are used? Explain in detail. [8]

UNIT-IV

- 7 a) The following table gives the number of defects in a casting used for making crankcase of a diesel engine. [7]

Casting no	1	2	3	4	5	6	7	8	9	10
Number of defects (c)	15	11	25	10	12	20	15	10	17	13

Construct a C-chart with 3 sigma limits and comment on the casting process.

- b) Suppose an organization utilizes a variable based measurement system for process control. During a period, it was found that while all the plotted observations within the control limits in the X bar chart, one point was lying outside the control limits in the R chart. What should the organization do in this case? [8]

(OR)

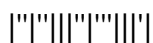
- 8 a) Explain the concepts of single and double sampling plans. [7]
 b) What is 'work sampling' and what are its uses? Explain in detail with a suitable example of your own. [8]

UNIT-V

- 9 a) What are the different merit rating systems? Explain the advantages and disadvantages. [7]
 b) Explain Halsey's plan and Rowan's plan in detail with an example. [8]

(OR)

- 10 a) What are the benefits of job evaluation and its limitations? [7]
 b) Explain Bedaux's plan and Emerson's efficiency plan in detail with examples. [8]



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Answer any FIVE Questions
ONE Question from Each unit
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UNIT-I

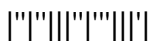
- 1 a) Discuss the contributions of Taylor to the theory of management. [7]
Explain why is he regarded as the father of scientific management.
b) Explain the McGregor's theory 'X' and theory 'Y'. How do these [8]
theories help to motivate the employees?
(OR)
- 2 a) What are managerial functions? How are they integrated? [7]
b) Explain briefly the Fayol's principles of management. [8]

UNIT-II

- 3 a) Explain features, advantages, limitations and suitability of following [7]
layouts:
a) Product layout b) Process layout c) Fixed position layout.
b) Suppose you are given three alternative designs for the layout of a shop [8]
floor in a manufacturing organization. How will you decide which of
the three is the most appropriate?
(OR)
- 4 a) Discuss the main objective which a factory planning engineer should [7]
attempt to achieve when designing a plant layout. Explain what is
meant by a travel chart and show how such a chart can be of use in
determining the best relative location of departments in a factory?
b) Is layout design for a service organization any different from that of a [8]
manufacturing organization? Explain your answer in detail?

UNIT-III

- 5 a) What are the objectives of 'Time study' and how is it organized? [7]
b) What are the techniques in micro-motion study? Explain in detail. [8]
(OR)



6. a) What is ergonomics? Explain principles of ergonomics. [7]
b) Explain steps in stopwatch time study for determining Standard time. [8]

UNIT-IV

- 7 a) What are desirable characteristics of a sample taken for sampling plan? [7]
Explain.
b) Suppose an organization utilizes a variable based measurement system [8]
for process control. During a period, it was found that while all the
plotted observations within the control limits in the X bar chart, on
point was lying outside the control limits in the R chart. What should
the organization do in this case?

(OR)

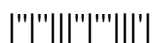
- 8 a) Explain working principle of double sampling plan with a flow chart. [7]
b) State the advantages and limitations of stopwatch time over work [8]
sampling.

UNIT-V

- 9 a) Explain straight piece rate and differential piece rate wage plan in [7]
detail.
b) How workers are classified and what are the incentive plans for indirect [8]
workers?

(OR)

- 10 a) List out various methods of job evaluation. Explain any two of them in [7]
detail.
b) Explain Gantt plan and group plan in detail with suitable examples. [8]



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UNIT-I

- 1 a) “Theory X and Theory Y are concerned with the nature of people”. [7]
How does the job situation affect the application of this theory? What are its implications?
b) What are the quantitative tools of Industrial Engineering? Explain in [8]
detail.

(OR)

- 2 a) How do functional areas of management differ from management [7]
functions? Discuss the major functional areas of management
b) In what respect have Fayol’s principles of management resulted in [8]
contributions to management methods that are different from the
techniques of Taylor’s scientific management?

UNIT-II

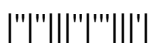
- 3 a) Give a over view in Therblings. [7]
b) What are quantitative techniques for optimal design of layouts? Briefly [8]
explain each.

(OR)

- 4 a) What are the different types of layouts? How should an organization [7]
decide on which layout to choose?
b) Explain the importance of travel chart in effective layout of a [8]
production plant. Prepare a travel chart for a hypothetical engineering
concern with 4 functional departments, i.e. foundry, machining,
welding and inspection.

UNIT-III

- 5 a) A department store manager wishes to make a work sampling study to [7]
estimate the percentage time that clerks are busy waiting for customers
and percent time that they are idle. The current best guess is that clerks
are idle 25 percent of the time. Determine the number of observations
required if we wish to be 95 percent confident that the results is within
 \pm percent, given the number of observations at 20% is 2995 and at 30%
it is 3750 for the same precision
Compare stopwatch study and work sampling in terms of the cost to
make studies, representatives of samples taken, the field of application,
and comparative accuracy



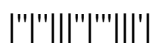
- b) What is the various method of study symbols? Explain & Compare the outline process chart and flow process chart [8]
outline process chart and flow process chart
(OR)
- 6 a) A time study was made of a punch press operator. The average observed time after discounting non-normal occurrences was 0.52 minutes per unit. The operator performance was judged to be 90 and the allowances for this type of work total 12 percent. What are the normal time and standard time for this job? [7]
- b) Explain steps in the stopwatch time study for determining Standard time. [8]

UNIT-IV

- 7 a) A manufacturer of garments wants to set up a quality control system using control charts for process control. The manufacturer has three options to choose from: i) Measure the critical dimensions of the garment for establishing its quality. ii) Segregate every batch of production into good quality and seconds' quality. iii) Estimate the number of defects for the bale of cloth issued for production [7]
- b) The manufacturer is not sure about what it means to choose which of the above. Prepare a report explaining the pros and cons of each of the choices, the nature of efforts required to setup control charts and implications of their use [8]
From the above statement, i) Determine the standard time using the experienced industrial engineer's worker rating. ii) Find the standard time using the worker rating of an inexperienced industrial engineer. iii) Comment on the reliability of time study engineers
(OR)
- 8 a) Suppose an organization utilizes a variable based measurement system for process control. During a period, it was found that while all the plotted observations with in the control limits in the X bar chart, on point was lying outside the control limits in the R chart. What should the organization do in this case? [7]
- b) Write in detail about Quality circles in TQM. Explain the application. [8]

UNIT-V

- 9 a) Explain in detail HRM. What is the importance and functions of HRM? [7]
- b) Explain the concept of human resource management and Write the functions of personnel management. [8]
(OR)
- 10 a) Explain in detail Value engineering and its implementation procedure in detail. [7]
- b) How is Enterprise resource planning done? Explain in detail. [8]



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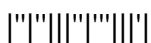
Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks

UNIT-I

- 1 a) Write the differences between production management and industrial engineering. What is the role of an industrial engineer? [7]
b) What do you understand by a system? Discuss management as the system by bringing out its basic features as such. [8]
(OR)
- 2 a) How do functional areas of management differ from management functions? Discuss the major functional areas of management [7]
b) In what respect have Fayol's principles of management resulted in contributions to management methods that are different from the techniques of Taylor's scientific management? [8]

UNIT-II

- 3 a) What is plant layout and write the factors governing plant location? [7]
b) Suppose you are given three alternative designs for the layout of a shop floor in a manufacturing organization. How will you decide which of the three is the most appropriate? [8]
(OR)
- 4 a) Identify an appropriate layout for each of the following situations. [7]
Justify your choice in a sentence or two:
1) A manufacturer of garments for Van Heusen.
2) A multi-cuisine restaurant in a posh residential area in Mumbai.
3) The overhaul of helicopters.
4) A fabricator of custom-made PCBs for a large number of electronic applications.
5) An eye hospital.
6) A motor manufacturer manufacturing 4 product groups for worldwide markets.
7) A manufacturer of large turbines for power sector applications.
b) What are the various data analyzing forms in plant layout? Explain them in detail and Differentiate between process layout and product layout. [8]



UNIT-III

- 5 a) What are the various types of allowances to be considered in the calculations of standard time? [7]
b) The worker in an engineering company is expected to work for 420 min in a shift of 8 hrs. The remaining time is allowed for rest and personal needs etc. (i) Determine the standard time per piece of a job whose normal time is 4 min (ii) Calculate the number of pieces produced per day (iii) If the worker produced 100 pieces in his shift what is his efficiency. [8]

(OR)

- 6 a) Explain in detail the concept of zero defect, and quality circles and also explain where they are implemented. [7]
b) What is the significance of ISO quality systems? Explain six sigma principle in detail. [8]

UNIT-IV

- 7 a) Suppose an organization utilizes a variable-based measurement system for process control. During a period, it was found that while all the plotted observations were within the control limits in the X bar chart, one point was lying outside the control limits in the R chart. What should the organization do in this case? [7]
b) Why queuing assurance is needed in TQM? Explain in detail. [8]

(OR)

- 8 a) Explain why SQM is needed and brief single and double sampling methods. [7]
b) Detail about X and R charts with suitable examples for each. [8]

UNIT-V

- 9 a) What is Job-evaluation and why it is needed? Explain the types of job evaluation. [7]
b) Define merit rating and what are the quantitative methods followed for merit rating? Explain. [8]

(OR)

- 10 a) Explain in detail Value engineering and how it is implemented. [7]
b) Explain in detail enterprise resource planning and supply chain management. [8]

