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S.E. (Robotics and Automation)
INDUSTRIAL ENGINEERING AND MANAGEMENT
(2019 Pattern) (Semester - IV) (211508)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.*

2) *Neat diagrams must be drawn wherever necessary.*

3) *Figures to the right indicate full marks.*

4) *Assume suitable data, if necessary.*

Q1) a) Describe the elements of entrepreneurial ecosystem. **[8]**

b) Describe various funding organizations which supports an entrepreneurship. **[9]**

OR

Q2) a) Describe the support organizations which helps an entrepreneurship (start ups) **[9]**

b) Describe the factors which motivates entrepreneurship. **[8]**

Q3) a) Describe the following tools and techniques of Industrial Engineering. **[8]**

i) Work study

ii) Micro motion study

iii) Value analysis

iv) Plant layout

b) Define Productivity, Total and Partial Productivity. **[9]**

The following data is available for a company. The output is Rs. 20,00,000. Calculate Partial productivity considering the input resources and total productivity.

Input Resources	Rs.
Labour	4,00,000
Material	8,00,000
Capital	5,00,000
Energy	1,00,000
Other expenses	1,50,000

OR

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Q4) a) Describe Taylor Piece Wage System and Merrick Piece Wage System with suitable illustration. State the advantages and limitations of these systems. **[8]**

b) Define Job evaluation and Job specification. What are the different methods of Job evaluation? **[9]**

Q5) a) Define Method study. Explain the different factors to be considered while selecting the job for method study. **[9]**

b) Describe Two Handed process chart with suitable illustration and appropriate symbols. **[9]**

OR

Q6) a) Describe String diagram and Travel chart. **[9]**

b) Describe Multiple activity chart with appropriate symbols. **[9]**

Q7) a) Describe the process to carry out work sampling study. State how the standard time is calculated using work sampling study. **[9]**

b) The following data is available for a cycle using stop watch time study. Determine **[9]**

i) Normal time for a given cycle

ii) Standard time (Assuming 15% Allowance)

Element No.	Observed time(Min)	Rating(%)
1	1.5	100
2	2	110
3	2.9	100
4	1	110
5	1.4	120
6	3.2	100
7	2	120

OR

Q8) a) Describe various steps used in time study. **[9]**

b) The following data is collected from work sampling study. **[9]**

Determine

i) Normal time

ii) Standard time (Assuming 15% Allowance)

Duration of the study (Hrs)	192
Total number of units produced during study	640
Total number of observations	3000
Number of observations of productive work	2400
Number of observations of machine controlled work	1600
Average performance rating	90
Total allowances (%)	15

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