[6361]-59

B.E. (Mechanical) (Insem)
INDUSTRIAL ENGINEERING
(2019 Pattern) (Semester - VII) (Elective - III) (402044 (D))

Time : 1 Hour]   *[Max. Marks : 30*

Instructions to the candidates:
1) *Solve Q.1 or Q.2, Q.3 or Q.4.*
2) *Figures to the right indicate full marks.*
3) *Use of electronic calculator is allowed.*
4) *Assume suitable data, if necessary.*

Q1) a) Explain the term Productivity? Also explain any two Productivity Measurement Models. **[8]**

b) Define the term : - Industrial Engineering. **[7]**

The total inputs and outputs have been converted in to money value and are given below.

Calculate total productivity and partial productivity for different categories of inputs.

Material input = Rs. 80,000

Human input = Rs. 50,000

Energy input = Rs. 35,000

Capital input = Rs. 4,50,000

Miscellaneous input = Rs. 70,000

Total output = Rs. 8,00,000

OR

Q2) a) Explain the term management science? Also discuss the characteristics of management science. **[7]**

b) Write a short note on **[8]**

i) PDCA chart

ii) 5 "S"

P.T.O.

Q3) a) What is Therbligs? Give any 5 Therbligs with symbols. **[7]**

b) Following are the element time of machining operation. Calculate Normal time and standard time for this job. **[8]**

Element	Observed time (Min)	Frequency	Performance rating	Relaxation allowance (%)
1	0.15	1	100	12
2	0.12	1	90	15
3	0.08	1	75	11
4	10.00	1/50	80	11
5	6.00	1/55	90	13

OR

Q4) a) Write a short note on **[8]**

i)   Flow diagram

ii) Two handed process chart

b) A work sampling study was conducted to 60 hours in the factory shop in order to estimate the standard time. The total numbers of observations recorded were 2500. No working activity could be noticed for 500 observations. The ratio between manual and machine element was 3 : 1. Average performance rating was estimated as 80% and the total numbers of pieces produced during the period of the study were 120. Estimate standard time of the job assuming 15% as the relevant allowances. **[7]**

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