Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (MECHANICAL AND INDUSTRIAL AND PRODUCTION ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: WORK SYSTEMS ENGINEERING [MME 4038]

REVISED CREDIT SYSTEM
(03/12/2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. Define Work study. Why it is valuable? **(02)**

1B. Explain the factors responsible for addition of excess work content. What are the management techniques available for reducing the excess work content? **(05)**

1C. Explain the Contingency allowance and Special allowances used in standard time computation. **(03)**

2A. Explain Interference allowance and Load factor. **(02)**

2B. Define Time study. Explain the steps involved in Time study. **(03)**

2C. The following observations were made in a Method study on an operator in charge of one machine :

Description of events	Time (min)
Preparation of job	2
Putting away finished job	1
Stopping and unloading of machine	5
Loading and starting of machine	7
Automatic processing by the machine	38

Draw a Multiple activity chart with proportionate time scale for the best sequence and compute the percentage utilization of resources. If the operator is paid Rs 14/- per hour and machine costs Rs 32/- per hour, compute the cost per piece. **(05)**

3A. What is the need of dividing the job into elements in Time study? **(02)**

3B. Explain the principles of motion economy with regard to use of human body and design of tool and equipment. **(04)**

3C. With a neat sketch explain the SIMO chart. **(04)**

4A. Write a note on Work sampling. **(02)**

4B. Explain any four methods of rating. **(04)**

4C. Five observations taken for an element in a Time study are as follows. Find out whether the number of observations are sufficient considering 95% confidence level and ± 5% precision.

Time in decimal min.

8
5
7
7
6

(04)

5A. Distinguish between Cyclegraph and Chronocyclegraph. **(02)**

5B. Explain Continuous, Fly back and Differential methods of timing the elements. **(03)**

5C. Calculate the standard time from the data given below and represent the various constituents in a Pump diagram.

Elements	Average observed time (in decimal units)	Rating (%)
Element A (outside work)	180	90
Element B (outside work)	70	110
Element C (inside work)	110	120

Machine controlled time = 460 decimal units.
P.N.A = 15 %, F.A. = 5 %
(1 min = 100 decimal units)

(05)