Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

V SEMESTER B.TECH (INDUSTRIAL AND PRODUCTION ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: WORK SYSTEMS ENGINEERING [MME 325]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** the questions.
- Missing data may be suitably assumed.

1A. Define productivity. How it affects standard of living? **(02)**

1B. Discuss the human factor in the application of Work study. **(03)**

1C. Explain the factors responsible for the addition of ineffective time. How the ineffective time can be minimized? **(05)**

2A. Explain restricted work and machine interference. **(02)**

2B. Define Work measurement. Explain the steps involved in Work measurement. **(03)**

2C. Prepare a Flow process chart for the following observations. Identify its type.

A technician in a metallurgical lab takes a specimen from a cabin. He carries the specimen to a polishing machine 15 metres away, starts the machine, sprinkles the chemical solution on the revolving table top and waits for 3 minutes. He then places the specimen on the top of the table and gently presses it for 4 minutes. He takes the specimen to wash basin (8 metres away) and cleans the specimen (1min). The specimen is etched (3 min) and again washed (1 min) and dried (1min). He takes the etched specimen to a microscope (10 metres away) and examines (3 min). Finally he deposits the specimen in a cupboard 20 metres away. **(05)**

3A. How the sample size is determined in Time study? **(02)**

3B. List any twelve Therbligs along with their symbols and abbreviations. **(03)**

3C. Discuss the principles of motion economy. **(05)**

4A. Distinguish between Contingency allowance and Policy allowance. **(02)**

4B. How the standard time of a job is computed? **(03)**

4C. Define an element. Explain the classification of elements in the context of Time study. **(05)**

5A. Explain the Continuous and Differential methods of timing in Time study. **(02)**

5B. Distinguish between THPC and SIMO chart. **(03)**

5C. Construct a man-machine chart for the best sequence for the following activities performed by an operator in charge of one machine. Calculate the percentage utilization of resources.

Sl.no.	Element description	Time (min)
(i)	Picks up casting from the box and walks to the machine	0.08
(ii)	Positions and fastens castings in the machine	0.10
(iii)	Starts the machine and engages feed	0.09
(iv)	Casting is machined(unattended by the operator)	0.25
(v)	Stops the machine	0.03
(vi)	Unfastens and removes the casting	0.10
(vii)	Walks back to the box and deposits the casting	0.08

(05)

6A. Write a note on Standard data. **(02)**

6B. Explain any three rating methods. **(03)**

6C. 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)	Ratng(%)
Element A (outside work)	190	80
Element B (outside work)	80	120
Element C (inside work)	120	110

Machine controlled time = 480 decimal units.
P.N.A = 15 %, F.A. = 5 %
(1 min = 100 decimal units)

(05)