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A Constituent Institution of Manipal University

V SEMESTER B.TECH. (MECHANICAL / I & P ENGINEERING)

END SEMESTER MAKE UP EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: PE II: WORK SYSTEMS ENGINEERING [MME 4038]

REVISED CREDIT SYSTEM
(05/01/2017)

Time: 3 Hours   MAX. MARKS: 50

Instructions to Candidates:

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

1A.	Discuss the resources at the disposal of an enterprise.	**(02)**
1B.	Write a note on human factor in the application of Work study.	**(03)**
1C.	How the total time of a job is made up? Explain the factors responsible for the addition of ineffective time and the management techniques available to minimize ineffective time.	**(05)**
2A.	Explain Work cycle and Machine interference.	**(02)**
2B.	Define Time study .Explain the steps involved in Time study.	**(03)**
2C.	Prepare a Flow process chart for the following observations and Identify its type:	

2C. 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.	Explain the rules for dividing a job into elements.	**(02)**
3B.	What is Micromotion study? List any Twelve types of Therbligs along with their symbols and abbreviations.	**(05)**

3C. With a neat sketch explain the Two handed process chart. **(03)**

4A. Write a note on Standard data. **(02)**

4B. Explain the classification of elements in Time study with an example to each. **(04)**

4C. With a neat sketch explain the components of a Pump diagram. **(04)**

5A. Write a note on Ergonomics. **(02)**

5B. Explain any three rating methods. **(03)**

5C. The following observations were made in a Method study on an operator in charge of two machines X and Y:

Description of events	Time (in min)	
	Machine X	Machine Y
Cleaning and checking the finished job	3	1
Preparing a job for machining	2	1
Stopping and unloading the machine	4	3
Loading and starting the machine	6	4
Automatic processing by machine	26	11

Draw a Multiple activity chart for the best possible sequence. Find the percent utilization for each resource. What will be the cost per piece if man, machine X and machine Y costs Rs 20/-, Rs 30/- and Rs 15/- per hour respectively? **(05)**