

MANIPAL (A constituent unit of MAHE, Manipal)

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

MAKE-UP EXAMINATIONS, DECEMBER 2018

SUBJECT: WORK SYSTEMS ENGINEERING [MME 4038]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

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

1A.	How the Partial productivity is computed for an enterprise? (0	
1B.	Define Work measurement. Explain the steps involved in work measurement.	(03)
1C.	Explain the management techniques available for reducing the excess work content and ineffective time.	(05)
2A.	Explain Multiple machine work and Load factor.	(02)
2B.	Define Work study. Explain the steps involved in Work study.	(03)
2C.	Prepare a Flow process chart for the following observations and Identify its type: A technician in a metallurgical lab takes a specimen from a cabin. He carries	

the specimen to a polishing machine (15 m, 2 min), starts the machine, sprinkles the chemical solution on the revolving table top (1min) 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 (8m,1min) and cleans the specimen (1min). The specimen is etched (3 min) and again washed (1min) and dried (1min). He takes the etched specimen to a microscope (10m, 1.5min) and examines (3 min). Finally he carries the specimen to a cupboard and deposits (20m, 2.5 min). (05)

- **3A.** Explain Predetermined Time Standards technique. (02)
- **3B.** Discuss the classification of elements in Time study with an example to each. (04)
- **3C.** With a sketch explain the Pump diagram.

(04)

- **4A.** Define Unoccupied time allowance and Interference allowance. **(02)**
- **4B.** Distinguish between Travel chart and String diagram.
- **4C.** The following observations were made in a Method study on an operator in charge of one machine:

Description of events	Time (min)
Cleaning and checking the finished job.	8
Preparing a job for machining.	7
Stopping and unloading the machine.	4
Loading and starting the machine.	6
Automatic processing by the machine.	20

Draw Man-machine chart for the best sequence. Find the percent utilization of operator and machine. (04)

- **5A.** Explain the Questioning technique employed in Method study. **(03)**
- **5B.** With a neat sketch explain the Two handed process chart. (04)
- **5C.** Seven 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 $\pm 5\%$ precision.

<u>Time in decimal min.</u>	
7	
8	
7	
6	
7	
7	
8	(03)

(04)