Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of Manipal University, Manipal

V SEMESTER B.TECH (MECHANICAL ENGG.)

END SEMESTER MAKE UP EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: PE I: PLANT LAYOUT AND MATERIAL HANDLING [MME 4030]

REVISED CREDIT SYSTEM

(07/01/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.

1A. With a neat diagram explain the type of layout used in automobile manufacturing. Also mention its merits and demerits. **04**

1B. List and explain the services relating to material. **03**

1C. A process layout can produce 3 products A, B & C on a machine. Compute the number of machines required by considering the below given information. **03**

Particulars	**A**	**B**	**C**
Setup time in mins	30	60	15
Number of setup required per week	2	4	6
Standard time in minutes/Unit	1.2	0.75	0.3
Weekly demand in units	900	4500	2700
Operating hours/week – 48hours			
Allowances for scrap -10%			

2A. What are four considerations that affect the machinery factor: Explain. **04**

2B. State the objectives of good plant layout and explain any two of them. **03**

2C. An automobile equipment supplier wishes to install sufficient number of ovens to produce 4,00,000 good castings per year. The baking operation takes place 2minutes for casting and management requires the capacity cushion of 5%. How many ovens will be required, if the total available time in terms of capacity is 800Hrs/year. **03**

3A. Explain an operation process chart with neat diagram and example. **04**

3B. How does the waiting factor influence the method of storing? Explain in brief. **03**

3C. Assume that in order to produce the new fertilizer spreader on the assembly line requires doing the following steps in the order specified. Balance the line using longest task time method and take cycle time(c) =60seconds.

Work Element	Description	Time (seconds)	Immediate Predecessor(s)
A	Bolt leg frame to hopper	40	None
B	Insert impeller shaft	30	A
C	Attach axle	50	A
D	Attach agitator	40	B
E	Attach drive wheel	6	B
F	Attach free wheel	25	C
G	Mount lower post	15	C
H	Attach controls	20	D, E
I	Mount name plate	18	F, G

03

4A. Explain with neat sketches Belt conveyor and Bridge crane. **04**

4B. With a neat sketch and examples, explain the flow diagram in planning the layout. **03**

4C. Explain preference-matrix approach and load-distance analysis methods in selection of location. **03**

5A. What are the factors to be considered in the selection of material handling equipment? Explain. **04**

5B. Explain the operating principle involved in material handling. **03**

5C. Write a short note on the influence of change factor in plant layout. **03**