Reg.No.										

MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University, Manipal – 576 104

VII SEM. B.TECH. (INDUSTRIAL & PRODUCTION ENGG) DEGREE END SEMESTER (MAKE UP) EXAMINATIONS DECEMBER 2015

SUBJECT: PRODUCT DESIGN & MANUFACTURING (MME 411)
REVISED CREDIT SYSTEM
(30 /12 /2015)

Time: 3 Hours. MAX.MARKS: 50

Instructions to Candidates:
- Answer **ANY FIVE FULL** questions.
- Missing data, if any, may be suitably assumed.
- Draw neat sketches wherever necessary.
- Use of machine design data hand book is permitted.

1A) List the challenges in product development and explain stages in product development. (05)

1B) What design guidelines are to be considered for obtaining the sound castings? (05)

2A) What is the meaning of TIPS? How it is related to concept generation (05)

2B) Broadly classify the interview technique and explain. (05)

3A) Explain the force flow line for design C- clamp (05)

3B) With an example explain Material selection and evaluation process. (05)

4A) Define Fault Tree Analysis and explain methodology. (05)

4B) Discuss the quality management activities. And explain process-based quality. (05)

5A) Explain with neat sketches the factors to be considered in design for heat treatment (05)

5B) A total of 300 m length of tubes must be installed in a heat exchanger, in order to provide the necessary heat-transfer surface area. The total dollar cost of the installation includes (05)

1.the cost of the tubes,$700
2.the cost of the shell=25D2.5 L
3.the cost of the floor space occupied by the heat exchanger =20DL

The spacing of the tube is such that 20 tubes will fit in a cross-sectional area of $1m^2$ inside the shell. The optimization should determine the diameter D and the length L of the heat exchanger to minimize the purchase cost.

6) A gearbox is required to transmit 30 kW. The driving shaft runs at 1500 rpm and driven shaft is to have two speeds of 375 rpm and 500 rpm. Design the following elements of gear box assuming same material and module for all the gears. Use spur gears only and assume the centre distance as equal to 400 mm. (05+05)

a. Gears
b. Counter shaft.

****