Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of Manipal University, Manipal

VII SEMESTER B. TECH (IP ENGG.) END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: PRODUCT DESIGN & MANUFACTURING [MME 411]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** questions.
- Missing data may be suitable assumed.
- Use of design data hand book is permitted

1A. Define product strategy. Explain the different product strategies generally employed by the companies. **5 M**

1B. List the basic and advanced concept generation methods and explain any one advanced method. **5 M**

2A. Discuss in detail the performance characteristics of materials for their selection. **5 M**

2B. Define standardization. What are the activities and advantages of standardization? **5 M**

3A. What is buckling failure? Which are the preventive measures for buckling and instability? **5 M**

3B. Write the importance of FTA? Draw the FTA for failure of 'marine power plant'. **5 M**

4A. Explain with neat sketches the important considerations in design of parts for 'Drilling' and 'Milling'. **5 M**

4B. What is quality control and quality assurance? List and explain the various components for achieving quality in the product. **5 M**

5A. Explain the factors to consider in the designing of parts for turning operation. **5 M**

5B. A total of 300m of tubes are to be installed in a heat exchanger in order to provide the necessary surface area. The total rupee cost of installation includes: **5 M**

a. Total cost of tubes, Rs.700/-
b. The cost of shell=Rs.20DL, where D=Diameter of shell and L=Length of shell
c. Cost of floor space occupied=Rs.$25D^{2.5}L$

The spacing between tubes is such that 20 tubes will fit in a cross sectional area of $1m^2$ inside the shell. Determine the diameter and length of the shell to minimize the overall 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 gears and counter shaft of gear box unit assuming the same material and module for all gears. Use spur gears only and take the centre distance as equal to 400 mm. **(5+5)M**

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