Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

IV SEMESTER B.TECH (OPEN ELECTIVE-1)

END SEMESTER EXAMINATIONS, MAY 2016

SUBJECT: **INTRODUCTION TO COMPOSITE MATERIALS (MME 3286)**

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A) Explain Wet lay-up process of PMCs with a neat sketch. What are the disadvantages of wet lay-up process? **(03)**

1B) What are the advantages and disadvantages of Polyester, Vinyl ester and Epoxy resin? **(03)**

1C) Describe the composite properties based on fiber and resin. **(04)**

2A) Explain sheet moulding compound process of PMCs with a neat sketch. **(03)**

2B) List down any four advantages and disadvantages of bonded joints in composite materials. **(03)**

2C) State the rule of mixture. Write the assumptions made and hence derive an expression for modulus of elasticity for composites under Iso-strain condition. **(04)**

3A) A composite consisting of tungsten fibers in Copper matrix is to be prepared. If the volume fraction of tungsten and Copper are 0.55 and 0.45 respectively, determine the upper limit for the specific stiffness of the composite. Given that the respectively specific gravities of Copper and tungsten are 8.9 and 19.3 and elastic modulus are 110 and 407 GPa. **(03)**

3B) Define composites. What are the classifications of composite materials? **(03)**

3C) Explain fabrication of CMC by DIMOX process with neat sketch. What are the applications of DIMOX process? **(04)**

4A) With a neat sketch explain the Vacuum Bagging process in PMCs. **(03)**

4B) With a neat sketch explain the unidirectional solidification process in MMCs. **(03)**

4C) With the help of a neat sketch explain the manufacturing of PAN and Pitch based carbon fibers? **(04)**

5A) With a neat sketch explain the hot pressing fabrication process in MMCs. **(03)**

5B) Explain in detail, Microscopy and X-ray used in NDT of composite materials. **(03)**

5C) What are the properties of CMCs? Explain CVI technique with neat sketch. **(04)**