Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of Manipal University, Manipal

VI SEMESTER B.TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, JUNE 2017

SUBJECT: HEAT TREATMENT OF METALS AND ALLOYS

PROGRAMME ELECTIVE-III [MME 4006]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A.	Explain with a neat sketch, effect of alloying elements on the Fe-Fe_3C equilibrium diagram.	**05**
1B.	With a neat sketch label different regions of Isothermal transformation diagram for 0.8% Eutectoid steel. Super impose the cooling curve to obtain bainite and martensite phases.	**05**
2A.	Explain the following heat treatment cycles. i) Recrystallization annealing ii) Full annealing	**05**
2B.	With a neat sketch explain the Jominy end quench test method for the determination of hardenability.	**05**
3A.	With a neat sketch explain Induction hardening method.	**05**
3B.	Explain the following i) Carbo-nitriding ii) Cyaniding.	**05**
4A.	Write a note on i) Aluminium alloy ii) Magnesium alloy .	**05**
4B.	Explain precipitation hardening treatment for non-ferrous material.	**05**
5A.	Write a note on different types of stainless steels.	**05**
5B.	Write a note on i) Spheroidal cast iron ii) White cast iron.	**05**