Reg. No.



## VI SEMESTER B. TECH (MECHANICAL/IP ENGG.) END SEMESTER EXAMINATIONS, APRIL 2018

## SUBJECT: HAEAT TREATMENT OF METALS AND ALLOYS [MME 4006] REVISED CREDIT SYSTEM

Time: 3 Hours

## MAX. MARKS: 50

	<ul> <li>Instructions to Candidates:</li> <li>☆ Answer ALL the questions.</li> <li>☆ Missing data may be suitable assumed.</li> </ul>	
1A.	With relevant sketches explain the effect of alloying elements in steel on its eutectoid temperature and eutectoid composition.	4
1 <b>B</b> .	On the part of iron carbon equilibrium diagram, show the homogenizing and empering temperature ranges for plain carbon steel. Describe why that range is selected?	d 3 s
1C.	Explain the following heat treatment defects. a) Lower hardness b) Warping	3
2A.	With heat treatment cycle, explain the following thermomechanical treatments for nherently fine grained steel.	or <b>4</b>
<b>4</b> D	a) Thermomechanical annealing b) Cryoforming	2
2 <b>B</b> .	With heat treatment cycle explain the heat treatment of high speed steel.	3
2C.	Write a short note on precipitation (age) hardening.	3
3A.	With heat treatment cycle, explain the Controlled annealing treatment for nalleabilization.	or 4
3B.	Explain the statement. a) "It is better to give Normalizing treatment prior to Hardening".	3
3C.	With relevant sketches explain the Jominy hardness test for hardenability of allogeteel.	y <b>3</b>
4A.	Explain the standard heat treatment for maraging steel with heat treatment cycle.	4
<b>4B.</b>	With suitable graphs explain the process of austenite formation from eutectoic pearlite. Also list the factors that influence austenite formation on heating.	d 3
4C.	Write a note on classification of cast iron and their application.	3
5A.	<ul> <li>Write short notes on the following:</li> <li>a) Aluminum alloys</li> <li>b) Transformer steel</li> <li>c) Graphitizing annealing</li> </ul>	2x5=10

- d) Skin effect
- e) Austempered ductile iron