



**II SEMESTER M.TECH. (MET) END SEMESTER EXAMINATIONS,
APRIL/MAY 2017**

SUBJECT: ADVANCED HEAT TREATMENT [MME 5268]
REVISED CREDIT SYSTEM

MAX. MARKS: 50

Instructions to Candidates:

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

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|------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 1A. | With heat treatment cycle, explain the following thermomechanical treatments for Ni-Cr steel: | 5 |
| i) | Isoforming | ii) Cryoforming. |
| 1B. | With suitable heat treatment cycle explain the standard heat treatment for tool steel used for cold drawing die. | 5 |
| 2A | Draw neatly Iron carbon phase diagram and using this diagram find the composition of steel containing 90 weight percentage as pearlitic phase. | 5 |
| 2B. | Explain the following: | 5 |
| i) | The active nucleus of pearlitic transformation. | |
| ii) | Effect of heating temperature on austenite formation. | |
| 3A. | Write short notes on: | 5 |
| (i) | Nitriding of 4310 steel. | (ii) Flame hardening of 1340 steel. |
| 3B. | With suitable heat treatment cycle explain the standard heat treatment for 25% Ni – Maraging steel. | 5 |
| 4A. | Write short notes on: | 5 |
| (i) | Bainitic transformation | (ii) Characteristic of Martensite transformation. |
| 4B. | With part of phase diagram and heat treatment cycle explain Age hardening treatment for Al 7075 alloy. | 5 |
| 5A. | Justify the following: | 5 |
| i) | It is better to homogenize steel before normalising. | |
| ii) | It is better to give post carburizing treatment on the pack carburized components. | |
| 5B. | With suitable heat treatment cycle explain the controlled annealing treatment for malleabilization of white cast iron. | 5 |