B.E. METALLURGICAL AND MATERIAL ENGINEERING
THIRD YEAR SECOND SEMESTER SUPPLEMENTARY EXAM 2023

SUBJECT: SOLID STATE PHASE TRANSFORMATION PROCESSES

Time: 3 hours **Full Marks: 100**

Answer any four (4) questions. Answers must be brief and to the point.

1	What is carburizing? What are the different types of carburizing? In what way can the core microstructure of the carburized sample be refined?	7+10 +8
2	What are the applications of time temperature transformation diagram? By what method can you generate time temperature transformation diagram of 0.8 wt% plain carbon steel?	10+ 15
3	What are annealing, normalizing and hardening? Differentiate the microstructures of 0.3 wt% plain carbon steel after annealing, normalizing and hardening.	12+ 13
4	In what manners do hardness of the 0.3 wt%, 0.8 wt% and 1.1 wt% plain carbon steels change after annealing? Why does hand saw blade break during cutting of quenched steel?	15+ 10
5	In what way can the wear resistance be improved in hypereutectoid steel? What is hardenability? What is Jominy end quench test?	8+7+ 10
6	What are the problems of grain coarsening of steel? What is eutectoid transformation in steel? Why is ferrite in pearlite 8 times larger than cementite?	10+ 10+5