

Code No: 153BC

**R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, March - 2021

**MATERIAL SCIENCE AND METALLURGY**

(Common to ME, MCT)

Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) Define unit cell. Draw and explain the S.C, B.C.C and F.C.C structures.  
b) With the help of neat diagrams, explain two type of dislocations. [7+8]
- 2.a) Define solid solution. Explain different types of solid solutions with the help of neat sketches.  
b) Explain briefly about point defects. [7+8]
- 3.a) Explain the eutectic, peritectic, peritectoid and monotectic reactions.  
b) Explain the different types of phase diagrams. [7+8]
- 4.a) Define heat treatment. Draw the general heat treatment cycle.  
b) Explain atleast 3 types of annealing processes. [7+8]
5. Explain the method of construction of isothermal transformation curves for eutectoid steels. [15]
- 6.a) Explain austempering and martempering processes with the help of isothermal curves.  
b) Explain the importance of continuous cooling curves by comparing with isothermal curves. [7+8]
7. What do you mean by carburizing process? Explain 3 types of carburizing process with the help of neat sketches. [15]
8. Define cast irons. Explain the microstructure, properties and applications of white, malleable and grey cast irons. [15]

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