Code No: 153BC

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, March - 2022
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) Calculate Atomic Packing Factor for BCC and FCC.
 b) What are the imperfections in solids? Explain any two types.   [7+8]

2.a) What is Critical resolved shear stress? Derive the equation related to CRSS.
 b) Write short notes on ceramics.   [8+7]

3.a) Draw a phase diagram for two metals A and B, which are soluble in each other at all compositions.
 b) Explain all invariant reactions those occur in Iron – Iron carbide diagram.   [7+8]

4.a) Draw the micro structural changes those are occurring during the cooling of 0.4%C steel.
 b) Calculate the percentage amount of ferrite, proeutectiod ferrite and cementite in 0.6% steel.   [7+8]

5.a) What is the aim of Annealing? Explain about any two types.
 b) Draw TTT diagram for eutectoid steel and label.   [8+7]

6.a) Discuss about transformations of pearlite with neat diagrams.
 b) Compare and contrast between normalizing and hardening.   [8+7]

7.a) What is carburizing? Discuss any two types.
 b) What are the differences between flame and induction hardening?   [8+7]

8.a) What are the properties and uses of stainless steel and tool steel?
 b) Write short notes on (i) brass and (ii) Cupro-Nickel.   [7+8]

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