

Code No: 153BC**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech II Year I Semester Examinations, August/September - 2022****MATERIAL SCIENCE AND METALLURGY****(Common to ME, MCT)****Time: 3 hours****Max. Marks: 75**

Answer any five questions
All questions carry equal marks

1. The axis of a cylindrical crystal of copper lies in the (1 1 1) plane. Show that, when a tensile stress σ is applied along the axis of the crystal, the resolved shear stress τ in any direction on this plane is zero. [15]
2. Describe how slip occurs in single crystals. [15]
- 3.a) Define an alloy. Discuss about Hume-Rutherytules.
b) Write down the eutectic, peritectic, eutectoid and peritectoid reactions with suitable examples. [7+8]
- 4.a) Explain the different stages of tempering.
b) What is spheroidising? [8+7]
5. Discuss the phase transformation of austenite to pearlite under equilibrium cooling. [15]
- 6.a) Discuss about continuous cooling curves and their importance.
b) Explain nitriding process. [8+7]
- 7.a) What are stainless steels and tool steels?
b) What are the properties of brass and bronze? What are their uses? [8+7]
8. What are the properties and uses of
a) Titanium and its alloys
b) Maraging steels and white cast iron. [7+8]

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