

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: BTECH
BRANCH: PROD**

**SEMESTER: III
SESSION : MO/2019**

SUBJECT : PE201 METALLURGY

TIME: 2 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 25.
 2. Candidates may attempt for all 25 marks.
 3. Before attempting the question paper, be sure that you have got the correct question paper.
 4. The missing data, if any, may be assumed suitably.
-

- Q1 (a) Give the details about the lattice parameters and type of unit cells which exist for following crystal system: [2]
i) Tetragonal
ii) Orthorhombic
- Q1 (b) Explain in detail about the HCP structure, give its various parameters along with some examples. [3]
- Q2 (a) Explain the following: [2]
i) Piezoelectric materials
ii) Magnetostrictive materials
- Q2 (b) Define Metallurgy. What are the various categories of Metallurgy? [3]
- Q3 Draw the Iron Carbon Diagram. Label it properly and indicate each phase existing in the diagram. [5]
- Q4 (a) What is pearlite? Explain its microstructure and composition along with a diagram. [2]
Q4 (b) What is the effect of adding following alloying elements to steel- Cobalt, Manganese? [3]
- Q5 (a) Explain the concept of strain hardening in materials. [2]
Q5 (b) Explain the formation of Martensite from Austenite in steels. [3]

: : : : : 23/09/2019 : : : : : E