Code No: R1621031   **R16**   SET - 1

II B. Tech I Semester Supplementary Examinations, May - 2018
METALLURGY & MATERIALS SCIENCE
(Com to ME & AME)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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PART –A

1. a) Define Space Lattice. (2M)

    b) What is the significance of liquidus, solidus and solvus lines in phase diagram? (3M)

    c) Compare nodular cast iron and malleable cast iron. (3M)

    d) When will you prefer annealing? (2M)

    e) What are the properties of Titanium alloys? (2M)

    f) List abrasive materials. (2M)

PART -B

2. a) Explain point defect, Line defect and plane defect. (7M)

    b) Mention the types of solid solutions with examples (7M)

3. a) Write equations for the following invariant reactions: eutectic, peritectic, monotectic, eutectoid and peritectoid. How many degrees of freedom do exist at invariant reaction points in binary phase diagram? (7M)

    b) Draw iron-carbon equilibrium diagram and mark on it all salient temperatures, composition and phases involved. (7M)

4. a) Classify different types of cast iron. Why silicon is added to cast iron? Explain the effects of any four alloying elements on the properties of cast iron. (7M)

    b) Explain the structure and properties of plain carbon steels. (7M)

5. a) Discuss different types of annealing processes. (7M)

    b) Define hardenability of a material and list the factors affecting hardenability. (7M)

6. a) What are the types of copper alloy, their composition, properties and applications? (7M)

    b) Enlist the properties of pure Aluminum and mention the composition, specific properties and applications of any one aluminum alloy. (7M)

7. a) What are Nano materials? What are their advantages? (7M)

    b) What is a Composite material? How it is classified? Explain briefly. (7M)