Paper ID: 4 0 0 2   **SUB CODE-RME301**

B. TECH.
(SEM-III) -THEORY EXAMINATION (2017-18)
MANUFACTURING SCIENCE

[Time: 3hrs]   **[Total Marks: 70]**

Note 1. Attempt all section. If require any missing data; then choose suitably.

SECTION –A

1. Attempt all questions in brief.   **[2x7=14]**

a) What is messier effect? Explain

b) Classify solids on basis of energy gaps. Briefly discuss any one.

c) What is a composite material? Give any two examples.

d) Write the eutectic and eutectoid reactions.

e) Define the term 'Packing efficiency'. Also give the formula for the same.

f) Define the term 'Miller Indices'.

g) Explain about Gibbs phase rule

SECTION-B

2. Attempt any three part of the following :   **[7X3=21]**

 a) What is refractory material? Give an example, main property and application.

 b) Differentiate between ferrous and nonferrous materials with suitable example

 c) Classify the Heat treatment and also explain about the normalizing

 d) Explain carburizing in brief.

 e) What are ceramics? Explain the classification of ceramics in detail with examples,

   properties and applications.

SECTION-C

3. Attempt any one part of the following :   **[7x1=7]**

 a) Calculate the atomic packing factor for the unit cell of BCC and FCC space lattice

 b) What is the non destructive testing? Explain any two with suitable example.

4. Attempt any one part of the following :   **[7x1=7]**

 a) What are the defects and imperfections in crystals? Describe them with neat sketches

 b) Explain Gibbs Phase rules. How is it used?

5. Attempt any one part of the following :   **[7x1=7]**

 a) What is meant by fracture? Explain the characteristics of brittle fracture and ductile

   fracture.

b) What do you mean by degree of freedom? What do you mean by destructive testing? Explain tensile test in detail with diagrams also draw the stress strain curve for mild steel and explain various points on this diagram.

6. Attempt any one part of the following :   **[7x1=7]**

a) Draw TTT diagram for eutectoid steel and explain the effect of cooling rate on the transformation, product and hardness obtained.

b) Distinguish between diamagnetic, paramagnetic and ferromagnetic materials. Explain its properties and applications.

7. Attempt any one part of the following :   **[7x1=7]**

a) Explain about Iron Carbon equilibrium diagram with a neat sketch.

b) What is Bragg's law? Explain in detail about X-ray diffraction method for determination of crystal structure with neat diagrams.