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**MARCH 2020 INSEM (T1)**  
**S. Y. B.TECH. (MECHANICAL) (SEMESTER - IV)**

**COURSE NAME: Material Science**

**COURSE CODE: MEUA22181**

**(PATTERN 2018)**

Time: [1 Hour]

[Max Marks: 20]

(\*) Instructions to candidates:

1. Attempt Q.1 **OR** Q.2, Q.3 **OR** Q.4, Q.5 **OR** Q.6
2. Figures to the right indicate full marks.
3. Use of scientific calculator is allowed.
4. Assume suitable data wherever required.

Q. 1) Draw and explain the Edge line dislocation? [4]

Demonstrate the atomic packing factor for FCC is more than BCC with proper calculations. [4]

**OR**

Q. 2) Write the difference in hot working and cold working. [4]

Why FCC is more ductile than HCP Metals? Explain? [4]

Q. 3) Explain why the hardness of razor blade can be checked with Rockwell C scale or Vickers? [4]

Draw the stress-Strain curve for Cast Iron and Mild Steel. [4]

**OR**

Q. 4) Draw the Charpy V notch specimen and loading. [4]

Explain the Fatigue fracture with neat diagram? [4]

Q. 5) Write in detail about: [4]

a) Numerical Aperture b) ultrasonic testing

**OR**

Q. 6) Draw the equilibrium diagram from the given data [4]

The metals are having 100% solubility in liquid state and 0% in solid state, draw the equilibrium diagram when the mixture is existing at 35%B at 415 temperature for reaction and 800 and 1000 are melting of A and B respectively? Label it properly? Write all about details and lines of Diagram.