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E-1138

B. E. III Semester (Main & Re) Examination, December – 2019

MATERIAL SCIENCE

Branch : (ME)

BME-302

Time : Three Hours] *[Maximum Marks : 60*

Note : Attempt all questions from **Section-A**, *Four* questions from **Section-B** and Three questions from **Section-C.**

Section – A : Filling the blanks/MCQ/ True, False (1 × 10 = 10 Marks)

Section – B : Short answer type questions. (5 × 4 = 20 Marks)

Section – C : Long/descriptive answer type questions. (10 × 3= 30 Marks)

SECTION – A

1. The Body Centered Cubic (BCC) Lattice is found in :

   (a) Aluminium (b) Copper

   (c) Cadmium (d) Tungston

2. The BHN for mild steel lies in the range of :

   (a) 50 to 70 (b) 70 to 100

   (c) 110 to 150 (d) 150 to 300

P. T. O.

3. Which of the following is a destructive test ?

(a) Radiography
(b) Compression Test
(c) Ultrasonic Inspection
(d) None of the above

4. Which hardness method is used to measure hardness of a single grain ?

(a) Rockwell
(b) Knoop
(c) Vickers
(d) Shore

5. Mild steel is :

(a) Hard Carbon Steel
(b) Medium Carbon Steel
(c) Low Carbon Steel
(d) None of the above

6. The following Constituents of steel is least strong and softest :

(a) Ferrite
(b) Pearlite
(c) Austenite
(d) Martensite

7. Minimum carbon content in cast Iron is :

(a) 1%
(b) 2%
(c) 3%
(d) 4%

8. Presence of which of the following makes pig iron hard :

(a) Sulphur
(b) Phosphorous
(c) Sodium
(d) Calcium

9. Dislocation in materials is ..... defect.

(a) Point
(b) Line
(c) Plane
(d) Casting

10. Purpose of Tempering is to improve :

(a) Ductility
(b) Malleability
(c) Hardness
(d) Machinability

SECTION – B

1. Describe different kind of X-ray crystallography.

2. Write short notes on ceramic materials and their applications.

3. What is NDT ? Explain in detail any two NDT methods for surface crack detection.

4. What is dislocation ? What are different types of dislocation ? Explain.

5. List classification of carbon steel ? Describe their properties and typical applications.

6. What is Corrosion ? Describe types of corrosion and method for corrosion preventions.

SECTION – C

1. Draw and explain the TTT diagram for eutectoid steel. Explain important transformation taking place in it on cooling.

2. Differentiate between ductile and brittle fracture. Explain the significance of ductile-brittle transition temperature.

3. Draw stress-strain diagram for mild steel. Explain phenomenon of yielding and strain hardening on it.

4. Draw hysteresis curve and explain it is detail. What is the roll of domains for it. Differentiate between hard and soft magnetic materials.
