MT 8/6/15 Mech-IV CBGS

QP Code :3480 1/1

Question .1 is compulsory. **Time: 3hours**

Solve any three questions from the remaining. **Marks: 80**

Marks are indicated on the right.

Q.1 Answer **any four** from the following: 20

a. Discuss the allotrophic modifications of pure Iron.

b. Define fracture and discuss various types of fracture.

c. What are dislocations? Classify them and discuss any one of them.

d. What is nitriding? How is it practised?

e. What are composites? Give a classification of composites.

Q.2 a. What is deformation? Explain the slip mode of deformation. 7

b. Define Fatigue. Draw the S-N curve and explain its interpretation. 7

c. Derive an expression for CRSS. 6

Q.3 a. Draw a neat and labeled Fe-Fe_3C diagram. 7

b. Discuss the cooling of 0.4 % C steel. 6

c. Explain the method of carburizing; also give examples of parts that are carburized. 7

Q.4 a. State Griffith's criteria of brittle fracture and derive the equation. 7

b. Draw neat and labelled microstructures of grey cast iron, 0.8% C steel and low carbon steel. 7

c. Define Hardenability and discuss factors affecting it. 6

Q.5 a. What are the various methods used for processing of polymers? Explain any one in detail. 7

b. What are High speed steels? How are they heat treated? 7

c. How are stainless steels classified? Discuss their properties and applications. 6

Q.6 Write short notes on **any four:** 20

a. Recrystallisation annealing

b. Stages of Creep

c. Methods used for nanomaterials synthesis

d. TTT diagram and its importance

e. Types of Cast irons.