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**4th Sem. / Auto Mech,Prod.,T&D,  
CAD/CAM,GE,CNC,Metallurgy,Mech.  
Engg,(Fabrication Tech)  
Subject : MATERIAL AND METALLURGY**

Time : 3 Hrs. HSBTEonline.com M.M. : 100

**SECTION-A**

**Note:** Very Short Answer type questions. Attempt any 15 parts. (15x2=30)

- Q.1
- Name various chemical properties of Engineering materials.
  - What is cementite?
  - Define creep.
  - List four types of cast iron.
  - Name the furnace in which Pig iron is refined as cast iron.
  - Define atomic packing factor.
  - What is unit cell?
  - Define fatigue.
  - Enlist two metals which have BCC structure. HSBTEonline.com

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- Give composition of grey cast iron.
- What is case hardening?
- Why alloys are developed?
- Name the process in which Nitrogen is diffused on surfaces.
- What are refractory materials?
- State the form of carbon present in cast iron. HSBTEonline.com
- Enlist two properties of ceramics.
- Give two uses of High Speed Steels.
- What is tempering process.

**SECTION-B**

**Note:** Short answer type questions. Attempt any ten parts HSBTEonline.com 10x4=40

- Q.2
- Enumerate various methods of manufacturing steel.
  - Give the arrangement of atoms of F.C.C. structure.
  - Explain fracture & creep.
  - State the objectives of annealing.

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- v) State the effect of chromium as alloying element in steel. HSBTEonline.com
- vi) Explain crystallography.
- vii) Differentiate between iron and steel.
- viii) What is Atomic Packing Factor?
- ix) List different types of cast iron.
- x) What is solid solution?
- xi) List properties of composites.
- xii) Explain case hardening.
- xiii) Define annealing.
- xiv) Give few applications of Plastics.
- xv) Explain unit cell with diagram.

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### SECTION-C

**Note:** Long answer type questions. Attempt any three questions. 3x10=30

Q.3 Draw iron carbon diagram and list various constituents and phases.

Q.4 Write short note on:- HSBTEonline.com

(I) Pearlite Transformation.

(ii) Martensitic Transformation .

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Q.5 Differentiate between case hardening and surface hardening. HSBTEonline.com

Q.6 How are deformations classified? Explain.

Q.7 What are ceramics? Explain their properties and applications.

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