

Total No. of Questions : 09

**B.Tech.(Marine Engineering) (2013 Batch) / (ME) (2011 Onwards)**  
**(Sem.-3)**

**Subject Code : BTME-306**

**Time : 3 Hrs.**

**INSTRUCTION TO CANDIDATES :**

- ## SECTION-A

- (a) Define alloy.

- (b) What are point defects? Name them.

- (c) Define allotropy.

- (d) What is cementite?

- (e) What is eutectoid cast iron?

- (f) Define Bainite.

- (g) Define critical cooling rate.

- (h) What is eutectic reaction?

- (i) Define normalizing.

- (j) Which gas is used for nitriding?

## SECTION-B

2. What is unit cell and space lattice? Calculate the radius and coordination number for FCC and BCC structure.
3. What are the surface imperfections? State the reasons of occurrence and their remedies.
4. State and explain the different stages of phase transformation.
5. What are solid solutions? Explain its different types in brief.
6. Differentiate between Austempering and Martempering.

## SECTION-C

7. Draw and neatly label the iron carbon diagram. Explain the various reactions involved while cooling and heating of steel.
8.
  - a) Draw and explain the TTT diagram.
  - b) Write short note on Jominy test.
9.
  - a) What is heat treatment? What are its advantages? Explain the annealing process in brief.
  - b) Describe the induction hardening process of case hardening with the help of suitable diagrams.