Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (Mechanical Engineering) (2018 Batch) (Sem.–4)

MATERIALS ENGINEERING

Subject Code : BTME-404-18

M.Code : 77549

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. Differentiate between atomic number and atomic mass.
2. What is Metallic Bond? List their characteristic properties.
3. Using suitable sketch, explain the difference between FCC and BCC unit cells.
4. Explain Theoretical Yield Strength.
5. What do you mean by steady-state diffusion process?
6. Define Phase.
7. Discuss the applications of lever rule.
8. What information can be derived from TTT diagram?
9. What is pearlite?
10. What is stainless steel?

SECTION-B

11. Explain the difference between Edge and Screw dislocations.

12. Explain the difference between slip and twinning.

13. What useful information can be obtained from phase diagrams? Draw and label phase diagram for binary isomorphous system.

14. Using Fe-C equilibrium diagram, explain the difference between Full and Partial annealing processes.

15. Why hardening is always followed by tempering treatment? Explain the various stages of tempering.

SECTION-C

16. What are various surface hardening treatments? Write note on carburizing and flame hardening treatments.

17. Discuss the classification of alloying elements in steels. Explain the effects of adding Si, W and Al on the properties of steels.

18. Write brief notes on the followings :

    a. Hardeneability of steel.

    b. Factors influencing diffusion

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.