Reg. No. : | | | | | | | | | | |

Question Paper Code: 32003

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Second Semester

Civil Engineering

01UPH203- MATERIAL SCIENCE

(Common to Mechanical Engineering)

(Regulation 2013)

Duration: 1:45 hour Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. State any two postulates of classical free electron theory of metals.
2. State Wiedemann-Franz law.
3. What is Hall Effect.
4. Write down the properties of compound semiconductors.
5. What is Bohr magnetron? Give its value.
6. Define Cooper pairs?
7. Define dielectric constant.
8. What is dielectric loss?
9. State some applications of shape memory alloys.
10. What is shape memory effect?
11. What is Meissner effect?
12. What are dielectric losses?
13. Define dielectric constant of a material.

14. What are metallic glasses?

15. What are carbon nanotubes?

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. Derive an expression for electron concentration in conductor using Fermi distribution function. Use it to find the Fermi energy of electrons at absolute zero. (10)

17. Obtain an expression for the intrinsic charge density of an intrinsic semiconductor. (10)

18. Explain the domain theory of ferromagnetism. Using that theory, explain the formation of hysteresis in ferromagnetic materials. (10)

19. Define Local field in a dielectric. Obtain an expression for the internal field in dielectric and hence Deduce Clausius-Mosotti equations. (10)

20. What are nano materials? How nano materials are synthesised by sol gel and ball milling technique. (10)