K20U 1299

Reg. No. : .....

Name : .....

III Semester B.Sc. Degree (CBCSS – Sup./Imp.)
Examination, November 2020
(2014 – '18 Admns.)
CORE COURSE IN PHYSICS
3B03PHY : ALLIED PHYSICS

Time : 3 Hours

Max. Marks : 40

SECTION – A

Answer **all** questions (very short answer type, **Each** question carries **1** mark) :

1. The packing fraction of sc structure is given by _____
2. The unit of coefficient of viscosity is _____
3. _____ method is well suited to coupled circuit solutions employs a system of loop or mesh currents.
4. According to Kirchoff's Voltage Law, the algebraic sum of all IR drops and e.m.f.s in any closed loop of a network is always _____ **(4×1=4)**

SECTION – B

Answer **any seven** questions (short answer type, **Each** question carries **2** marks) :

5. Determine the relationship between the lattice parameter a and the atomic radius r for monoatomic sc, bcc structures.
6. What is the instantaneous power for a.c through pure resistance alone ?
7. What is elastic limit ? State Hooke's law.
8. What are Miller indices ? What are the steps to find out the Miller indices ?
9. State Superposition Theorem.
10. State Kirchhoff's Laws.

P.T.O.

11. What is surface energy and expression for surface tension ?

12. State Bernoulli's Theorem.

13. Define reciprocity theorem.

14. Derive the expression for work done per unit volume in a strained wire. **(7×2=14)**

SECTION – C

Answer **any four** questions (short essay/problem type, **Each** question carries **3** marks) :

15. Explain Energy of a Liquid in motion.

16. Derive the expression for excess pressure inside a spherical liquid drop or an air bubble in a liquid.

17. State Theveniens and Norton's theorems.

18. In a cubic unit cell, find the angle between normals to the planes (111) and (121).

19. A square metal bar of 2.5 cm side, 37.95 cm long, and weighing 826 gm is suspended by a wire 37.85 cm long and 0.0501 cm radius. It is observed to make 50 complete swings in 335.7 sec. What is the rigidity coefficient of the wire ?

20. Explain maximum power transfer theorem. **(4×3=12)**

SECTION – D

Answer **any two** questions (Long essay type, **Each** question carries **5** marks) :

21. What is stream line flow? State and prove Bernoulli's Theorem.

22. Derive an expression for the couple per unit twist on a cylindrical rod.

23. Explain in detail the resonance in series LCR Circuit. Also determine the values of edge frequencies.

24. Derive an expression for growth of charge in an LCR circuit and explain the different conditions for oscillations.

(2×5=10)