



K17U 1979

Reg. No. :

Name :

III Semester B.Sc. Degree (CBCSS – Reg./Sup./Imp.)
Examination, November 2017
(2014 Admn. Onwards)
Core Course in Physics
3B03PHY : ALLIED PHYSICS

Time : 3 Hours

Max. Marks : 40

Instruction : Answer the questions in **English** only.

SECTION – A

Very short answer type. **Each** carries 1 marks. Answer **all 4** questions.

1. In a FCC cubic lattice the number of nearest neighbours for a given lattice point is _____ ?
2. Longitudinal strain is not possible in the case of gases true or false ?
3. The power factor at resonance in LCR parallel circuit _____ ?
4. Who discovered X-rays ? (4×1=4)

SECTION – B

Very short answer type. **Each** carries 2 marks. Answer 7 question out of 10.

5. What are miller indices ? How are they determined ?
6. Define surface energy. How is it related to surface tension ?
7. Calculate the number of carbon atoms per unit all of diamonds.
8. What is packing efficiency ? What are its values for sc, bcc, fcc and hcp ?
9. What are the theoretical limits to the value of Poisson ratio ? For a material $\alpha = 0.7$ comment ?
10. It is easier to spray water when soap is added to it than when it is pure why ?
11. State and explain Kirchhoff's laws.
12. Is it possible to determine the viscosity of water by stock's method ?

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13. What is meant by ideal constant current source ?
14. Explain the term Skin effect. (7×2=14)

SECTION – C

Short essay/problem type. **Each** carries 3 mark. Answer 4 questions out of 6.

15. What is the optimum order of x-ray wave length used to observe the diffraction effects ? What happens if the wavelength deviated too much from this value, explain.
16. Determine the relationship between the lattice parameter a and the atomic radius r for monoatomic SC, BCC and FCC structures.
17. A liquid drop of radius 10^{-8} m breaks into 64 tiny drops find the resulting change in energy ? Assumes that the surface tension of liquid is 75×10^{-3} N/m.
18. How to Thevenize a given circuit ? Explain.
19. Derive an expression for the moment of the couple required to twist one end of a cylinder when the other end is fixed ?
20. Derive an expression for decay of charge while discharging a capacitor. (4×3=12)

SECTION – D

Long essay type. **Each** carries 5 marks. Answer 2 questions out of 4.

21. Describe the powder method for x-ray diffraction. Discuss the formation of diffraction pattern on the photographic film.
22. What is a cantilever ? Obtain an expression for the depression at the free end of a thin light be clamped horizontally at one end and loaded at the other end.
23. Describe with theory, stock's method of determining the viscosity of a highly viscous fluid.
24. Derive an expression for growth of charge in an LCR circuit and explain the different conditions for oscillation. (2×5=10)