

18001848



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Reg. No.....

Name.....

M.Sc. DEGREE (C.S.S.) EXAMINATION, NOVEMBER 2018

Third Semester

Faculty of Science

Branch II : Physics–A–Pure Physics

Elective Bunch–C–Material Science

PH3 EC1—SOLID STATE PHYSICS

(2012 Admission onwards)

Time : Three Hours

Maximum Weight : 30

Part A

*Answer any **six** questions.
Each question carries 1 weight.*

1. Give the restrictions on symmetry elements.
2. State the features of Hexagonal system.
3. What are colour centers ? Explain.
4. Explain electroluminescence.
5. What is spatial coherence ? Explain.
6. Explain mode locking.
7. What are amorphous semi conductors ? Explain.
8. What is meant by Fermi liquid ?
9. What is screw dislocation ? Explain.
10. What are slip and plastic deformations ?

(6 × 1 = 6)

Part B

*Answer any **four** questions.
Each question carries 2 weight.*

11. Identify the seven crystal systems.
12. Give an account on excitons in molecular crystals.

Turn over





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13. Discuss the lasing action of a four level laser with energy diagram.
14. Briefly discuss the experimental determination of diffusion constant.
15. Bring out the forces acting on a dislocation.
16. Discuss the band structure of Germanium. Suggest modifications.

(4 × 2 = 8)

Part C

Answer all questions.

Each question carries 4 weight.

17. Describe the principal symmetry operations applicable to a three dimensional lattice. Show that the fivefold rotational axis is not permissible in case of lattices.

Or

Explain the physical basis for classifying crystals into 14 Bravais lattices, 7 systems and 32 point groups.

18. Discuss on Ruby laser and applications.

Or

Discuss the exciton theory for semi conductors.

19. Bring out the thermoelectric effects in semi conductors.

Or

Discuss on the density of holes and electrons in an intrinsic semi conductors and at arrive at Fermi level energy.

20. Discuss the atomic diffusion theory with experimental support.

Or

Discuss on colour centres and the technology to create colour centres in detail.

(4 × 4 = 16)

