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SVS-N-313 B-18
B.Sc. Vth Semester Degree Examination
PHYSICS
(Quantum Mechanics Statistical Mechanics and Material Physics)
Paper - 5.2
(New)

Time : 3 Hours

Maximum Marks : 80

Instructions to Candidates:

- 1) *Answer ALL Questions from section A, Any Five from Section B and Four from Section C.*

SECTION-A

- I. Answer ALL the following questions. (15×1=15)
1. When a charged particle is accelerated through potential difference V volts what happens to its K.E?
 2. Write any one property of wave function.
 3. What are matter waves?
 4. Define Eigen value.
 5. What are canonically conjugate variables?
 6. What is Ensemble?
 7. What are fermions?
 8. What is statistical equilibrium?
 9. What are paramagnetic materials?
 10. Define critical current.
 11. What is the location of fermi level in case of super conductors?
 12. What is magnetic Levitation?
 13. What is the surface area to Volume ratio in nano materials?
 14. What is the size of human hair?
 15. What is nano technology?

SECTION-B

II. Answer any Five of the following:

(5×5=25)

16. Describe G.P Thomson experiment.
17. State Heisenberg uncertainty principle. Illustrate with diffraction at a single slit.
18. Write note on Boltzmann equipartition theorem.
19. Write note on classification of Ferrites.
20. Write note on Meissner effect.
21. Explain sol Gel method for preparation of Nano materials.
22. Write note on quantum size effect.

SECTION-C

III. Answer any four of the following:

(4×10=40)

23. a. Derive Schrodinger Time independent wave equation.
b. Derive expression for probability current density. (5+5)
24. a. Derive expression for energy level of Linear Harmonic oscillator.
b. Write note on physical significance of Wave function. (7+3)
25. a. Derive expression for Fermi Dirac distribution function.
b. Distinguish between micro canonical and canonical ensembler. (6+4)
26. a. What is Hysteresis? Explain BH curve.
b. Write note on Application of nano materials. (6+4)
27. a. What is critical Magnetic field?
b. Explain Langevins theory of diamagnetism. (2+8)
28. a. Describe chemical vapour deposition method for preparation of nano materials.
b. Write note on reduction of dimension. (6+4)

