(FOR THE CANDIDATES ADMITTED

DURING THE ACADEMIC YEAR 2021-22 ONLY)   REG.NO.:

21PPS206

N.G.M.COLLEGE (AUTONOMOUS): POLLACHI

END-OF-SEMESTER EXAMINATIONS: JULY-2022

M.Sc. PHYSICS   **MAXIMUM MARKS: 70**

SEMESTER - II   **TIME: 3 HOURS**

CORE VI : CONDENSED MATTER PHYSICS

SECTION – A   **(10 X 1 = 10 MARKS)**

ANSWER THE FOLLOWING QUESTIONS.
MULTIPLE CHOICE QUESTIONS.   **(K1)**

1. Number of Bravais lattice are --------------------.
    (a) 7   (b) 14   (c) 10   (d) 4
2. Heat capacity per unit mass of a substance is called as ----------------- heat.
    (a) latent   (b) specific   (c) normal   (d) pseudo
3. Fermi- Dirac Statistics is applied to ----------------------- particles.
    (a) indistinguishable   (b) distinguishable
    (c) bosons   (d) normalized
4. In anti-ferromagnetism, a temperature above which the spins are free is --------------.
    (a) Curie   (b) Einstein   (c) Neel   (d) Weiss
5. Superconductivity was first discovered by ------------------------------------.
    (a) Onnes   (b) Meissner   (c) Cooper   (d) Bardeen

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES   **(K2)**

6. What is called the Primitive Basis/?
7. What is known as Dulong- Petit's law?
8. State Bloch theorem.
9. Define: Curie temperature.
10. Give the Meissner effect.

.   **SECTION – B**   **(5 X 4 = 20 MARKS)**

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)

11. (a) Explain the concept of Reciprocal Lattice.
                (OR)
    (b) With an example, explain the ionic bonding.

12. (a) Write a note on inelastic scattering of neutrons.
                (OR)
    (b) Discuss the Umklapp process.

13. (a) What are Brillouin zones? Explain.
                (OR)
    (b) Define and explain Fermi energy.

14. (a) Describe the Weiss theory of Ferromagnetism
                (OR)
    (b) Define: Ferromagnetic Domains with neat sketch, explain the activities of them.

15. (a) Write a note on Type- I and Type- II superconductors.

(OR)

(b) What are high temperature superconductors? Give a note on it

SECTION – C   **(4 X 10 = 40 MARKS)**

ANSWER ANY FOUR OUT OF SIX QUESTIONS. (K4 (Or) K5)
(16thQUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS
FROM Qn. No : 17 to 21)

16. What are Miller Indices? Give its salient features.

17. Give the basic ideas of Point Defect, Dislocations and Colour centres.

18. Describe the Einstein's theory of Specific Heat and deduce the expression for C_v.

19. Explain the classical free electron theory of metals.

20. Write a note on Langevin's theory of Diamagnetism and obtain the expression for diamagnetism..

21. Derive London's equations, and discuss the London Penetration depth.