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G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.



UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.

(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., PHYSICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
IV	PART - III	CORE	U21PH407	INTRODUCTION TO SOLID STATE PHYSICS

Date & Session: 16.11.2024/AN

Time : 3 hours

Maximum: 75 Marks

Course Outcome	Bloom's K-level	Q. No.	SECTION - A (10 X 1 = 10 Marks) Answer <u>ALL</u> Questions.
CO1	K1	1.	Crystal systems are classified in to _____. a) 4 classes b) 5 classes c) 6 classes d) 7 classes
CO1	K2	2.	Miller indices of the diagonal plane of a cube are _____. a) 1 0 0 b) 1 1 0 c) 1 0 1 d) 0 1 1
CO2	K1	3.	An example for a diamagnetic substance is _____. a) Silver b) Nickel c) Manganese d) Iron
CO2	K2	4.	Magnetic susceptibility is positive for _____. a) Paramagnetic Material b) Diamagnetic Material c) Ferromagnetic material d) Anti ferromagnetic material
CO3	K1	5.	Polarisation defined as the dipole moment per unit _____. a) length b) Area c) Volume d) Time
CO3	K2	6.	Metallic bond is _____. a) an unsaturated bond b) a saturated covalent bond c) a modified version of ionic bond d) weaker than secondary bond
CO4	K1	7.	The bond between the ice molecules is _____. a) ionic bond b) covalent bond c) metallic bond d) hydrogen bond
CO4	K2	8.	The cohesive energy of sodium chloride molecule is _____. a) 7.95 eV b) 7.45 eV c) 7.85 eV d) 7.35 eV
CO5	K1	9.	Which of the following is Type I superconductor? a) Lead b) Gold c) Vanadium d) Niobium
CO5	K2	10.	Below transition temperature a superconducting material exhibits _____. a) Only zero resistance b) Zero resistance and diamagnetism c) Only diamagnetic property d) Zero resistance and ferromagnetism
Course Outcome	Bloom's K-level	Q. No.	SECTION - B (5 X 5 = 25 Marks) Answer <u>ALL</u> Questions choosing either (a) or (b)
CO1	K3	11a.	With a neat sketch explain the structure of NaCl. (OR)
CO1	K3	11b.	Describe the face centred cubic structure.
CO2	K3	12a.	Give the Properties diamagnetic materials. (OR)
CO2	K3	12b.	Illustrate domain theory of ferromagnetism.

CO3	K4	13a.	Find an expression for electronic polarizability in dielectric materials. (OR)
CO3	K4	13b.	Write a note on ionic polarisation.
CO4	K4	14a.	Discuss about the cohesive energy of ionic solids. (OR)
CO4	K4	14b.	Explain in detail Vander Waals bonding.
CO5	K5	15a.	Compare Type – I and Type – II Superconductor. (OR)
CO5	K5	15b.	Briefly explain AC and DC Josephson effect in superconductors.

Course Outcome	Bloom's K-level	Q. No.	SECTION – C (5 X 8 = 40 Marks) Answer <u>ALL</u> Questions choosing either (a) or (b)
CO1	K3	16a.	Explain the Seven classes of Crystals. (OR)
CO1	K3	16b.	What are miller indices? How they are calculated?
CO2	K4	17a.	Explain Classical theory of Langevin's diamagnetism. (OR)
CO2	K4	17b.	Describe about the Weiss theory of paramagnetism.
CO3	K4	18a.	Deduce an expression for Clausius Mosotti Equations. (OR)
CO3	K4	18b.	Calculate the Lorentz field for a cubic structure.
CO4	K5	19a.	Discuss about the ionic and covalent bonding. (OR)
CO4	K5	19b.	Explain the application of sodium chloride crystals.
CO5	K5	20a.	Describe about Meissner effect with suitable diagram. (OR)
CO5	K5	20b.	Deduce an expression for London Equation.