University of Mumbai
Examination 2020

Program: First Year Engineering
Curriculum Scheme: REV- 2016
Examination: First Year Semester I
Course Code: FEC102 and Course Name: Applied Physics-I

Time: 1 hour Max. Marks: 50

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For the students: - All the Questions are compulsory and carry equal marks.

Q1.	Meissner effect occurs in superconductors due to which of the following properties?
Option A:	Diamagnetic property
Option B:	Magnetic property
Option C:	Paramagnetic property
Option D:	Ferromagnetic property
Q2.	Stacking sequence in face centered cubic (FCC) close packed structure is?
Option A:	AAAAA
Option B:	ABABAB
Option C:	ABCABC
Option D:	AABBAA
Q3.	The Heisenberg uncertainty principle is concerned with what two properties?
Option A:	Mass and velocity
Option B:	Momentum and position
Option C:	Position and velocity
Option D:	Momentum and mass
Q4.	When the temperature of either n-type or p-type increases, determine the movement of the position of the Fermi energy level?
Option A:	Towards up of energy gap
Option B:	Towards down of energy gap
Option C:	Towards Centre of energy gap
Option D:	Towards out of page
Q5.	Superconducting tin has a critical temperature of 3.7K at zero magnetic field and a critical field at 0.0306 Tesla at 0K. Find the critical field at 2K.
Option A:	0.0306 Tesla
Option B:	7.4 Tesla
Option C:	0.02166 Tesla
Option D:	0 Tesla
Q6.	_____ occurs when a foreign substance replaces an atom in a crystal.
Option A:	Vacancy defect
Option B:	Substitutional impurity
Option C:	Frankel defect
Option D:	Interstitial impurity

Q7.	Liquid crystal are generally composed of
Option A:	Circular molecule
Option B:	Rod like molecule
Option C:	Oval molecules
Option D:	Triangular molecules
Q8.	When does a normal conductor become a superconductor?
Option A:	At normal temperature
Option B:	At Curie temperature
Option C:	At critical temperature
Option D:	Never
Q9.	The walls of a particle in a box are supposed to be _____
Option A:	Small but infinitely hard
Option B:	Infinitely large but soft
Option C:	Infinitely large but soft
Option D:	Infinitely hard and infinitely large
Q10.	What is the velocity when the electric field is 5V/m and the magnetic field is 5A/m?
Option A:	1m/s
Option B:	25m/s
Option C:	0.2m/s
Option D:	0.125m/s
Q11.	FCC structure having atomic radius is 1.414 Aº. Find the interplanar spacing for (2 0 0) planes.
Option A:	1.999 Aº
Option B:	2.999 Aº
Option C:	3.999 Aº
Option D:	1.555 Aº
Q12.	Zero order fringe can be identified using _____
Option A:	White light
Option B:	Yellow light
Option C:	Achromatic light
Option D:	Monochromatic light
Q13.	Calculate the Hall Effect coefficient when number of electrons in a semiconductor is 10^{20}
Option A:	0.625
Option B:	0.0625
Option C:	6.25
Option D:	62.5
Q14.	In Newton's ring experiment, the diameter of the 10^{th} ring changes from 1.40 to 1.23 cm when a liquid is introduced between the lens and glass plate. What is the

	refractive index of the liquid?
Option A:	1.05
Option B:	1.15
Option C:	1.25
Option D:	1.35
Q15.	Which of the following equation describes Bragg's law of diffraction? (Assume that all symbols have their usual meaning.)
Option A:	$2d \sin\theta = \lambda$
Option B:	$2d = n\lambda$
Option C:	$2d = n\lambda \sin\theta$
Option D:	$2d \sin\theta = n\lambda$
Q16.	Calculate decrease in acoustic intensity level when the sound intensity is reduced to half of its original intensity
Option A:	1 dB
Option B:	2 dB
Option C:	3 dB
Option D:	4 dB
Q17.	De-Broglie equation states the:
Option A:	Dual nature
Option B:	Particle nature
Option C:	Wave nature
Option D:	Heat nature
Q18.	SONAR stands for
Option A:	Sound navigation and ranging
Option B:	Sound number approximation and ranging
Option C:	Sound nullifying ranging
Option D:	Sound measurement
Q19.	In the Hall Effect, the electric field is in x direction and the velocity is in y direction. What is the direction of the magnetic field?
Option A:	X
Option B:	Y
Option C:	Z
Option D:	XY
Q20.	Magnetostriction transmitter uses _____
Option A:	Electrostrictive phenomena
Option B:	Horizontal vibration of nickel tube
Option C:	Longitudinal vibration of nickel tube
Option D:	Horizontal vibration and Longitudinal vibration of nickel tube
Q21.	For a particle inside a box, the potential is maximum at x = _____
Option A:	L

Option B:	2L
Option C:	L/2
Option D:	3L
Q22.	The defect that occurs due to a displacement of an ion is known as _____
Option A:	Vacancy defect
Option B:	Schottky defect
Option C:	Frankel defect
Option D:	Interstitial defect
Q23.	How does a semiconductor behave at absolute zero?
Option A:	Conductor
Option B:	Insulator
Option C:	Semiconductor
Option D:	Protection device
Q24.	The loudness (or intensity) of a sound wave is related to its
Option A:	Duration
Option B:	Frequency
Option C:	Wavelength
Option D:	Amplitude
Q25.	Find the energy of Neutron in units of electron-Volt whose de-Broglie wavelength is 1 Aº. Given m_n= 1.674x10^{-27} Kg and h=6.62x 10^{-34} J.Sec
Option A:	0.012 eV
Option B:	0.021eV
Option C:	0.081eV
Option D:	0.018eV