

University of Mumbai

Examination 2020

Program: First Year Engineering

Curriculum Scheme: REV- 2019 'C' Scheme

Examination: First Year Semester I

Course Code: FEC102 and Course Name: Engineering Physics-I

Time: 1 hour

Max. Marks: 50

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

University of Mumbai
Examination 2020

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 Å. Find the interplanar spacing for (2 0 0) planes.
Option A:	1.999 Å
Option B:	2.999 Å
Option C:	3.999 Å
Option D:	1.555 Å
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

University of Mumbai
Examination 2020

	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.	A thin layer of colorless oil is spread over water in a container ($\mu = 1.4$). If the light of wavelength 640 nm is absent in the reflected light, what is the minimum thickness of oil layer?
Option A:	179.6 nm
Option B:	198.3 nm
Option C:	207.6 nm
Option D:	214.3 nm
Q17.	De-Broglie equation states the:
Option A:	dual nature
Option B:	particle nature
Option C:	wave nature
Option D:	Heat nature
Q18.	If instead of monochromatic light white light is used for interference of light, what would be the change in the observation?
Option A:	The pattern will not be visible
Option B:	The pattern will not be visible
Option C:	Colored fringes will be observed with a white bright fringe at the center
Option D:	The bright and dark fringes will change position
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.	Which of the following does not show any interference pattern?
Option A:	Soap bubble
Option B:	Excessively thin film
Option C:	A thick film
Option D:	Wedge Shaped film
Q21.	For a particle inside a box, the potential is maximum at $x =$ _____

University of Mumbai
Examination 2020

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 shape of the fringes observed in interference is _____
Option A:	Straight
Option B:	Circular
Option C:	Hyperbolic
Option D:	Elliptical
Q25.	Find the energy of Neutron in units of electron-Volt whose de-Broglie wavelength is 1 \AA . Given $m_n = 1.674 \times 10^{-27} \text{ Kg}$ and $h = 6.62 \times 10^{-34} \text{ J.Sec}$
Option A:	0.012 eV
Option B:	0.021eV
Option C:	0.081eV
Option D:	0.018eV