

**University of Mumbai**  
**Examination 2020 under cluster \_\_\_ (Lead College Short name)**

Program: Bachelor of Engineering

Curriculum Scheme: 2012

Examination: First Semester I

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

Time: 1-hour

Max. Marks: 50

NOTE to the Question Paper Setter: (To be deleted before submitting the paper to Semester Coordinator)

1. The question bank consists of 25 MCQ questions with each question carrying a maximum of 2 marks. It should cover all the modules with appropriate weightages.
2. You need to check the questions and their answers for their correctness. There should not be any ambiguity in the questions and the options. Only one option should be the Correct Answer.
3. You must ensure that the same question is not repeated again in this question paper.
4. Among 25 questions, 13 questions can be under the 'Simple' category, 7 questions can be under the 'Moderate' category, and the remaining 5 questions can be under the 'Difficult' category.
5. Please do not reveal answer on this Question Paper.
6. Use another template provided to enter the correct answers.
7. Please save this file with file name as per the sample format given below:

File Name: "Date of Examination\_Scheme\_Program\_Semester\_Subject Code\_QP Set Number"

For example:

QP set number 1 of first core course of Mechanical Engineering Semester V for Rev2016 scheme and scheduled on 2/12/2020 has to have the file name as

**0212\_R16\_Mech\_V\_MEC501\_QP1**

QP set number 3 of Department Level Optional Course of Computer Engineering Semester VI for Rev2012 scheme and scheduled on 12/12/2020 has to have the file name as

**1212\_R12\_Comp\_VI\_CSDLO6021\_QP3**

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

Q1.	Which of the following has a non-crystalline structure?
Option A:	Iron
Option B:	Quartz
Option C:	Silica glass
Option D:	Tungsten
Q2.	Basic source of magnetism _____.
Option A:	Charged particles alone
Option B:	Movement of charged particles
Option C:	Magnetic dipoles
Option D:	Magnetic domains
Q3.	Which of the following is associated with an electron microscope?
Option A:	Matter waves
Option B:	Electrical waves
Option C:	Magnetic waves
Option D:	Electromagnetic waves
Q4.	The atomic packing fraction in a body centered cubic unit is cell is _____
Option A:	0.74

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Option B:	0.52
Option C:	0.68
Option D:	0.66
Q5.	How is the resistance of semiconductor classified?
Option A:	High resistance
Option B:	Positive temperature co-efficient
Option C:	Negative temperature co-efficient
Option D:	Low resistance
Q6.	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
Q7.	What is the coordination number of a simple cubic (SC) unit cell?
Option A:	4
Option B:	6
Option C:	8
Option D:	2
Q8.	When is ultrasonic waves produced using piezo electric oscillator?
Option A:	At constant temperature
Option B:	At resonance
Option C:	At constant pressure
Option D:	At constant voltage
Q9.	Pure Si at 300 K has equal electron ( $n_i$ ) and hole concentration ( $p$ ) of $1.5 \times 10^{16} \text{ m}^{-3}$ . Doping by indium increases $p$ to $4.5 \times 10^{22} \text{ m}^{-3}$ . What is $n$ in the doped silicon?
Option A:	$4.5 \times 10^9 \text{ m}^{-3}$
Option B:	$4.5 \times 10^{22} \text{ m}^{-3}$
Option C:	$5 \times 10^9 \text{ m}^{-3}$
Option D:	$5 \times 10^{22} \text{ m}^{-3}$
Q10.	Zener diode is designed to specifically work in which region without getting damaged?
Option A:	Active region
Option B:	Breakdown region
Option C:	Forward bias
Option D:	Reverse bias
Q11.	How are charge carriers produced in intrinsic semiconductors?
Option A:	By pure atoms
Option B:	By electrons

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Option C:	By impure atoms
Option D:	By holes
Q12.	If vibrations of a string are to be increased by a factor 2, tension in the string must be made _____
Option A:	Half
Option B:	Twice
Option C:	Four times
Option D:	Eight times
Q13.	The tension in the piano wire is 10N. What should be the tension in the wire to produce a note of double the frequency?
Option A:	5N
Option B:	20N
Option C:	40N
Option D:	80N
Q14.	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:	Soft and Small
Option D:	Infinitely hard and infinitely large
Q15.	How does a semiconductor behave at absolute zero?
Option A:	Conductor
Option B:	Insulator
Option C:	Semiconductor
Option D:	Protection device
Q16.	Units for magnetic flux density
Option A:	Wb / m <sup>2</sup>
Option B:	Wb / A.m
Option C:	A / m
Option D:	Tesla / m
Q17.	Example for anti-ferro-magnetic materials
Option A:	Salts of transition elements
Option B:	Rare earth elements
Option C:	Transition metals
Option D:	Ferrites
Q18.	A family of directions is represented by
Option A:	$(hkl)$
Option B:	$\langle uvw \rangle$
Option C:	$\{hkl\}$
Option D:	$[uvw]$

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Q19.	For plane (1 1 1) of FCC having a lattice parameter 'a', planar atomic density is given by?
Option A:	$2.31/a^2$
Option B:	$2.31/a^3$
Option C:	$1.31/a^2$
Option D:	$1.31/a^3$
Q20.	Which diode is designed to work under breakdown region?
Option A:	Photodiode
Option B:	Light Emitting Diode
Option C:	Solar Cell
Option D:	Zener diode
Q21.	Which of the following effects can be used to produce ultrasonic waves?
Option A:	Magnetostriction effect
Option B:	Doppler Effect
Option C:	Magnetic effect
Option D:	Sound effect
Q22.	What is the principle for measurement of the velocity of ultrasonic waves?
Option A:	Magnetostriction effect
Option B:	Acoustical grating
Option C:	Doppler Effect
Option D:	Acceleration effect
Q23.	Effective number of atoms in a face centered cubic (FCC) unit cell is equal to ___
Option A:	4
Option B:	1
Option C:	8
Option D:	2
Q24.	Which of the following can be used to create a P-Type Semiconductor?
Option A:	P
Option B:	Sb
Option C:	Ga
Option D:	As
Q25.	For a quantum wave particle, $E =$ _____
Option A:	$\hbar k$
Option B:	$\hbar \omega$
Option C:	$\hbar \omega/2$
Option D:	$\hbar k/2$

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