

USN/  
ROLL  
NO

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



Internal Assessment Test 2 – May 2024

Sub:	Physics for EEE stream					Sub Code:	BPHYE202	Branch:	ECE		
Date:	21/05/2024	Duration:	90 mins	Max Marks:	50	Sem/Sec:	II Sem / M,N,O & P			OBE	
<b>Answer any FIVE FULL Questions</b>										CO	RBT
<b>Given: <math>c = 3 \times 10^8</math> m/s; <math>h = 6.625 \times 10^{-34}</math> Js; <math>k = 1.38 \times 10^{-23}</math> J/K; <math>m_e = 9.1 \times 10^{-31}</math> kg; <math>e = 1.6 \times 10^{-19}</math> C, <math>\epsilon_0 = 8.854 \times 10^{-12}</math> F/m</b>										MARKS	
1 (a)	Define internal field. Derive an expression for Clausius- Mossotti equation.					[06]	CO2	L2			
(b)	Discuss any two polarization mechanisms in dielectric materials.					[04]	CO2	L2			
2 (a)	Define Fermi factor. Explain the variation of Fermi factor with temperature and energy.					[06]	CO2	L2			
(b)	The Fermi energy of a metal is 5.5eV at 0K. Find the energy for which there is 1% probability of finding the electron at 330K.					[04]	CO2	L3			
3 (a)	With the help of neat diagrams, discuss the different types of optical fibers .					[06]	CO1	L2			
(b)	For an optical fiber, given that the numerical aperture is 0.30 and RI of cladding is 1.53. Calculate the fractional index change and the acceptance angle.					[04]	CO1	L3			

PTO

USN/  
ROLL  
NO

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



Internal Assessment Test 2 – May 2024

Sub:	Physics for EEE stream					Sub Code:	BPHYE202	Branch:	ECE		
Date:	21/05/2024	Duration:	90 mins	Max Marks:	50	Sem/Sec:	II Sem / M,N,O & P			OBE	
<b>Answer any FIVE FULL Questions</b>										CO	RBT
<b>Given: <math>c = 3 \times 10^8</math> m/s; <math>h = 6.625 \times 10^{-34}</math> Js; <math>k = 1.38 \times 10^{-23}</math> J/K; <math>m_e = 9.1 \times 10^{-31}</math> kg; <math>e = 1.6 \times 10^{-19}</math> C, <math>\epsilon_0 = 8.854 \times 10^{-12}</math> F/m</b>										MARKS	
1 (a)	Define internal field. Derive an expression for Clausius- Mossotti equation.					[06]	CO2	L2			
(b)	Discuss any two polarization mechanisms in dielectric materials.					[04]	CO2	L2			
2 (a)	Define Fermi factor. Explain the variation of Fermi factor with temperature and energy.					[06]	CO2	L2			
(b)	The Fermi energy of a metal is 5.5eV at 0K. Find the energy for which there is 1% probability of finding the electron at 330K.					[04]	CO2	L3			
3 (a)	With the help of neat diagrams, discuss the different types of optical fibers .					[06]	CO1	L2			
(b)	For an optical fiber, given that the numerical aperture is 0.30 and RI of cladding is 1.53. Calculate the fractional index change and the acceptance angle.					[04]	CO1	L3			

PTO

- 4 (a) Obtain an expression for numerical aperture and arrive at the condition for propagation of signal in an optical fiber [6]  
 (b) Discuss the intensity based displacement sensor using optical fibers [4]
- 5 (a) Give a brief account of the BCS theory of superconductivity. [6]  
 (b) The critical field is  $2.7 \times 10^4$  A/m at 9K and  $5.3 \times 10^4$  A/m at 6K . Calculate the transition temperature and the critical magnetic field at 0 K. [4]
- 6 (a) Differentiate between Type I and Type II superconductors. [6]  
 (b) Explain the construction and working of Maglev vehicles. [4]
- 7 (a) Discuss point to point communication system. Mention its advantages and disadvantages. [6]  
 (b) The attenuation co-efficient of an optical fiber is 0.18 dB/Km. What fraction of its initial intensity remains after 1200m? [4]

CO2	L2
CO2	L2
CO2	L2
CO2	L3
CO2	L2
CO2	L2
CO1	L2
CO1	L3

- 4 (a) Obtain an expression for numerical aperture and arrive at the condition for propagation of signal in an optical fiber [6]  
 (b) Discuss the intensity based displacement sensor using optical fibers [4]
- 5 (a) Give a brief account of the BCS theory of superconductivity. [6]  
 (b) The critical field is  $2.7 \times 10^4$  A/m at 9K and  $5.3 \times 10^4$  A/m at 6K . Calculate the transition temperature and the critical magnetic field at 0 K. [4]
- 6 (a) Differentiate between Type I and Type II superconductors. [6]  
 (b) Explain the construction and working of Maglev vehicles. [4]
- 7 (a) Discuss point to point communication system. Mention its advantages and disadvantages. [6]  
 (b) The attenuation co-efficient of an optical fiber is 0.18 dB/Km. What fraction of its initial intensity remains after 1200m? [4]

CO2	L2
CO2	L2
CO2	L2
CO2	L3
CO2	L2
CO2	L2
CO1	L2
CO1	L3