BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2024)

CLASS: IMSc **SEMESTER : IV**
BRANCH: PHYSICS **SESSION : SP/2024**

SUBJECT: PH209 ANALOG SYSTEMS AND APPLICATIONS

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Describe different types of materials and discuss about band gaps.	[2]	CO1	Analyse
Q.1(b)	Draw and discuss the Fermi energy level of intrinsic and extrinsic semiconductor.	[3]	CO1	Understand
Q.2(a)	Define mobility and conductivity. Derive the expression for conductivity for n-type and p-type semiconductor.	[2]	CO1	Understand
Q.2(b)	What is the importance of rectifier? Derive an expression for RMS value of output current in full wave rectifier.	[3]	CO1	Analyse
Q.3(a)	Discuss about the ripple factor of half wave and full wave rectifier.	[2]	CO1	Analyse
Q.3(b)	What is a transistor? Discus the current gain α, β, and γ. Derive the relation between α and β.	[3]	CO2	Create
Q.4(a)	Draw the circuit of CB, CE and CC mode transistor. Compare the different characteristics of these modes.	[2]	CO2	Understand
Q.4(b)	What is LED? Find the wavelength of the radiation of GaAs LED having band gap of 1.4eV.	[3]	CO1	Evaluate
Q.5(a)	What is the advantages of using hybrid (h)-parameters? Write the different parameters used for CE modes.	[2]	CO2	Understand
Q.5(b)	Discuss the basic principle of Zener diode, Photodiode and Solar cell. Discuss the construction and applications.	[3]	CO1	Remember

::::::23/02/2024::::::M