BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP2023)

CLASS: IMSc **SEMESTER : IV**
BRANCH: PHYSICS **SESSION : SP2023**

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
Q1	(a)	Draw energy level diagram of p-type and n-type semiconductor and explain.	[2]	CO1	Knowledge
Q1	(b)	Define mobility and drift velocity. Derive the relation for total current density in p-n junction diode.	[3]	CO1	Comprehensive
Q2	(a)	What is rectifier? What do you mean by efficiency of rectification?	[2]	CO1	Knowledge
Q2	(b)	What is full wave rectifier? Derive an expression for total ac output for the case of full wave rectifier and find the efficiency.	[3]	CO1	Evaluation
Q3	(a)	Define ripple factor. What is the ripple factor for half wave and full wave rectifier?	[2]	CO1	Knowledge
Q3	(b)	Write down the principle of (i) LED, (ii) Photodiode and (iii) Solar cell and explain?	[3]	CO1	Applications
Q4	(a)	Draw the symbol and construction of n-p-n and p-n-p transistor and explain each knob.	[2]	CO2	Knowledge
Q4	(b)	Define the terms α, β and γ used in the case of transistor. Derive the relationship between α and β.	[3]	CO2	Applications
Q5	(a)	What is the load line and how it is important?	[2]	CO2	Applications
Q5	(b)	What is the importance of h-parameter? What are the symbols used for CE amplifier using Hybrid Model? Explain meaning of each symbol.	[3]	CO2	Knowledge

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