BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: IMSc **SEMESTER : IV**
BRANCH: PHYSICS **SESSION : SP/2023**

SUBJECT: PH209 ANALOG SYSTEM AND APPLICATIONS

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Distinguish between conductor and semiconductor. What do you understand by energy band? Draw the energy level diagram of n-type and p-type semiconductors	[5]	I	Understand Analyse
Q.1(b)	What is full form of LED? What is its symbol? How can you change its colours? Explain its construction and working.	[5]	I	Remember
Q.2(a)	What do you understand by CB, CE and CC mode? Draw the circuit of each mode. What is the meaning of α and ß and γ in a transistor?	[5]	II	Understand
Q.2(b)	What are the advantages of using h-parameters? What are the different notations of h-parameters and for what they imply? Explain the CE amplifier using hybrid model.	[5]	II	Remember
Q.3(a)	What is the need of feedback? Where does positive and negative feedbacks are used? Define stability with the feedback.	[5]	III	Understand
Q.3(b)	What is Barkhausen's Criterion? What are its conditions? Draw the circuit and explain the working of RC Phase shift oscillator.	[5]	III	Understand Create
Q.4(a)	Explain the meaning of each PIN of 741 IC. Explain the functions of OPAMP as Differentiator and Integrator.	[5]	IV	Remember
Q.4(b)	Describe the R-2R converter with the help of circuit diagram. Draw the circuit diagram of Analog to Digital converter.	[5]	V	Understand
Q.5(a)	A 5V stabilized power supply is required to be produced a 12V DC power supply input source. The maximum power rating of the Zener diode is 2W. Using the Zener regulator circuit, calculate (i) maximum current flowing, (ii) minimum value of the series resistor and the (iii) load current if load resistance is 1k ohm.	[5]	I	Evaluate
Q.5(b)	A CB base transistor amplifier has an input resistance of 10 ohm and output resistance of 100k ohm. The collector load is 1k ohm. If a signal of 0.5V is applied between E and B, find the amplification if current amplification factor is 1.	[5]	III	Evaluate

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