CBCS SCHEME

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BEE303

Third Semester B.E./B.Tech Degree Supplementary Examination, June/July 2024

Analog Electronic Circuits

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With neat sketches, explain the working of parallel clippers for positive clopping and negative clipping with reference voltage V_S.	10	L1	CO1
	b.	Determine the levels of I_{C_Q} and I_{CE_Q} for the voltage divider configuration using the EXACT and APPROXIMATE techniques. Use V_{CC} = 22V, R_1 = 39KΩ, R_2 = 3.9KΩ, R_C = 10KΩ, R_E = 1.5KΩ, β = 140.	10	L2	CO1
		OR			
Q.2	a.	For the Emitter stabilized bias circuit, derive the expression for Base Current (I_B), Collector Current (I_C), Collector to Emitter Voltage (V_{CE}), Collector Voltage(V_C), Emitter Voltage (V_E), Base Voltage (V_B) and Base to Collector Voltage (V_{BC}).	10	L1	CO1
	b.	What is bias stabilization? Derive an expression for $S_{(ICQ)}$ and $S_{(VBE)}$ for the fixed bias configuration.	10	L4	CO1
		Module – 2			
Q.3	a.	State and prove Millers theorem.	5	L1	CO2
	b.	Describe the two-port network and the hybrid model.	5	L1	CO2
	c.	What is CB configuration? Write the hybrid equivalent model for the CB configuration, and derive its h-parameters.	10	L4	CO2
		OR			
Q.4	a.	Write the method of analysis of transistor amplifier using h-parameter.	10	L3	CO2
	b.	For the network of CE amplifier in fixed bias configuration determine Z_i, Z_0, A_V and A_i. Given R_B = 330KΩ, R_C = 2.7KΩ, h_{fe} = 120, h_{ie} = 1.175KΩ, h_{oe} = 20μA/V, V_{CC} = 8V.	10	L4	CO2
		Module – 3			
Q.5	a.	Explain the need of cascade amplifier. Draw and explain the block diagram of two-stage cascade amplifier with an example.	10	L3	CO3
	b.	With the help of a neat circuit diagram, explain the working of Darlington Emitter flower and derive Z_i, A_i, A_v and Z_o.	10	L3	CO3
		OR			
Q.6	a.	Derive the expressions for input resistance output resistance and voltage gain for feedback amplifier employing voltage series feedback.	10	L3	CO3
	b.	Determine the voltage gain, input and output impedance with feedback for voltage series amplifier having A = –100, R_i = 10KΩ and R_o = 20KΩ for feedback β = –0.1 and β = –0.5.	10	L4	CO3

		Module – 4			
Q.7	**a.**	With neat sketches, explain the classification of power amplifiers.	**10**	**L2**	**CO3**
	b.	With necessary diagrams, explain the working of complementary symmetry class B amplifier and derive the expression for its maximum efficiency.	**10**	**L4**	**CO3**
		OR			
Q.8	**a.**	Explain the Barkhausen criterion for oscillations. With neat circuit diagram, explain the working of RC phase shift oscillator.	**10**	**L3**	**CO3**
	b.	Explain the working of colpitts oscillator with necessary sketches and expressions.	**10**	**L3**	**CO3**
		Module – 5			
Q.9	**a.**	List the differences between : i) FET and BJT ii) JFET and MOSFET.	**10**	**L1**	**CO3**
	b.	Perform the analysis and design for common source fixed bias configuration JFET.	**10**	**L4**	**CO3**
		OR			
Q.10	**a.**	With necessary sketches, explain the voltage divider biasing for JFET and MOSFET.	**10**	**L2**	**CO3**
	b.	With necessary sketch explain the working of common source MOSFET amplifiers.	**10**	**L2**	**CO3**

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