Third Semester B.E./B.Tech. Degree Examination, June/July 2025
Electronic Principles and 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.	Define the following: i) Voltage – divider bias ii) CC Amplifier iii) TSEB	6	L1	CO1
	b.	Discuss the importance of Emitter Resistance (R_E) with respect to voltage divider bias circuit on Q-point calculate with its supportive graph.	8	L2	CO1
	c.	Compare and summarize with respect to bias circuits; Emitter bias vs voltage divider bias vs two supply emitter bias.	6	L2	CO1
		OR			
Q.2	a.	With suitable circuit and waveforms, Discuss TSEB amplifier.	8	L2	CO1
	b.	Derive the voltage gain equation for the CE amplifier from T model and π model.	6	L2	CO1
	c.	Explain the concept of emitter follower amplifier with suitable waveforms and circuit.	6	L2	CO1
		Module – 2			
Q.3	a.	With neat circuits, deduce the common source amplifier using MOSFET (without R_s) obtain overall gain (G_v).	10	L2	CO2
	b.	Explain the biasing of a MOSFT using fixed V_g and a resistance in source, obtain the current I_d expression with neat circuit diagram.	10	L2	CO2
		OR			
Q.4	a.	Design an MOSFET model of small-signal equivalent circuit by considering various parameter of the model.	10	L2	CO2
	b.	With respect to common-gate amplifier. Derive the equation for overall gain, open circuit voltage gain and voltage gain.	10	L2	CO2
		Module – 3			
Q.5	a.	Discuss the concept of R to 2R ladder type digital to analog converter by considering 4-bit binary input with an Op-Amp circuit also demonstrate the equivalent analog output for the data "1010".	10	L2	CO3
	b.	Explain Colpitt's oscillators with its AC equivalent circuit and design parameter.	10	L2	CO3

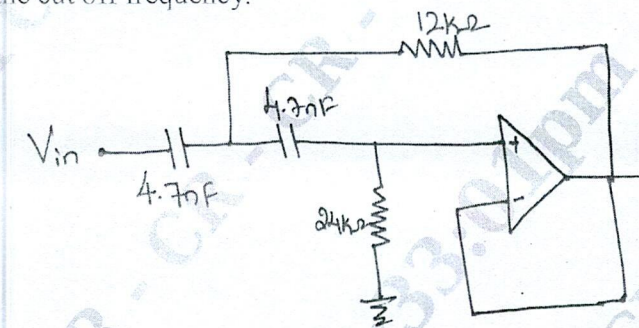|			M	L	C
		OR			
Q.6	a.	Explain the following in view of linear op-amps: i) Schmitt Trigger ii) Single supply comparator	10	L2	CO3
	b.	Design an astable multivibrator using 555 timer with design equations of "T" and frequency.	10	L2	CO3
		Module – 4			
Q.7	a.	Summarize various voltage and current amplifier and converter with respect to ideal negative feedback circuits.	10	L2	CO4
	b.	Explain low-pass first order stage with non-inverting unity gain and inverting with voltage gain with suitable op-amp circuit and equations.	10	L2	CO4
		OR			
Q.8	a.	Design an second order VCVS unity gain low pass filter for Butterworth responses with an Op-Amp circuit also comment on the frequencies of operation.	10	L2	CO4
	b.	Calculate the value of Q and pole frequency for circuit shown in Fig.Q.8(b) also find the cut off frequency. Fig.Q.8(b)	5	L2	CO4
	c.	Discuss the concept of MFB bandpass filter with the equation for "f_o".	5	L2	CO5
		Module – 5			
Q.9	a.	Briefly describe the concept of DC load line and AC load line with neat circuit	10	L2	CO5
	b.	Explain class B Push-Pull Emitter follower with neat circuit diagram discuss cross-over distortion.	10	L2	CO5
		OR			
Q.10	a.	Describe the concept of Gate-Triggering in silicon controlled rectifier.	8	L2	CO5
	b.	Write short notes on following: i) Photo SCR ii) UJT iii) PUT iv) Silicon controlled switch	12	L2	CO5

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