CBCS SCHEME

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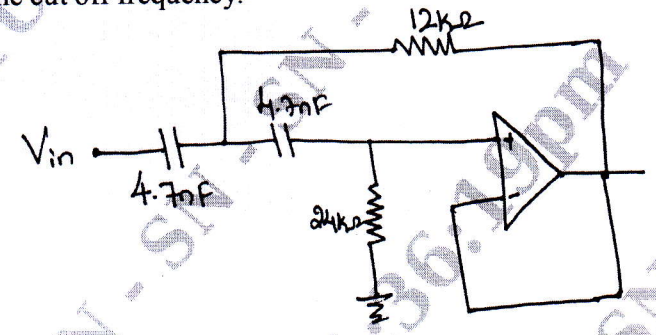
BEC303

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 MOSFET 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

		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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