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Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.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.	Derive expressions V_{in} , V_{out} and A_V for a common emitter circuit with ac equivalent circuit with π – model.	12	L1	CO2
	b.	What is the voltage gain and output voltage across the load resistor of V_{DB} amplifier? $R_1 = 10\text{ k}\Omega$, $R_2 = 2.2\text{ k}\Omega$, $R_C = 3.6\text{ k}\Omega$, $R_E = 1\text{ k}\Omega$, $R_L = 10\text{ k}\Omega$, $V_{CC} = 10\text{ V}$, $V_{BE} = 0.7\text{ V}$ and $V_{in} = 2\text{ mV}$.	8	L1	CO1
OR					
Q.2	a.	With a neat diagram, explain loading effect of input impedance.	10	L1	CO1
	b.	Explain three types of Bias circuit, (i) Emitter feedback bias. (ii) Collector feedback bias and (iii) Collector and emitter feedback.	10	L1	CO1
Module – 2					
Q.3	a.	Explain the three biasing methods to bias MOS amplifiers with neat circuit diagram.	10	L2	CO2
	b.	Explain the T-equivalent circuit model of MOSFET.	10	L3	CO2
OR					
Q.4	a.	With a small signal equivalent model of MOSFET, derive an expression of voltage gain and transconductance.	10	L2	CO2
	b.	Explain common source follower and derive the expression of voltage gain with necessary equation.	10	L2	CO2
Module – 3					
Q.5	a.	Explain R and 2R resistor Digital to Analog converter and also derive the expression of output voltage.	10	L2	CO3
	b.	With a neat circuit diagram, explain the operation of Monostable multivibrator.	10	L2	CO3
OR					
Q.6	a.	With a neat diagram, explain operation of RC-phase shift oscillator using op-amp. Write the expression for frequency of oscillations.	8	L2	CO3
	b.	With a net diagram, explain operation of crystal oscillator using BJT and Write necessary equations.	6	L2	CO3
	c.	A crystal has these values $L = 3\text{ H}$, $C_s = 0.05\text{ PF}$, $R = 2\text{ k}\Omega$ and $C_m = 10\text{ PF}$. What are the series and parallel resonant frequencies of the crystal?	6	L3	CO3

Module – 4					
Q.7	a.	Explain the first order Low Pass filter with frequency response.	10	L2	CO4
	b.	Explain the two types of Band Pass filters.	10	L2	CO4
OR					
Q.8	a.	Explain the four types of Negative feedback circuits.	10	L2	CO4
	b.	Explain the working of 2 nd order high pass filter with a neat circuit and frequency response.	10	L2	CO4
Module – 5					
Q.9	a.	Explain two load lines with necessary circuit diagram and equations.	10	L2	CO5
	b.	With a neat diagram, explain the working of a Thyristor.	10	L2	CO5
OR					
Q.10	a.	Explain Basic Construction and working of IBGTs with necessary figure.	10	L2	CO5
	b.	With a neat diagram, explain the working of UJT relaxation oscillator.	10	L2	CO5

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