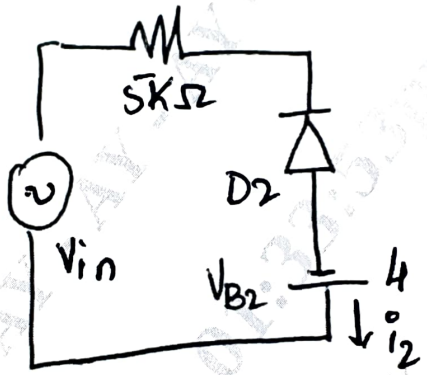
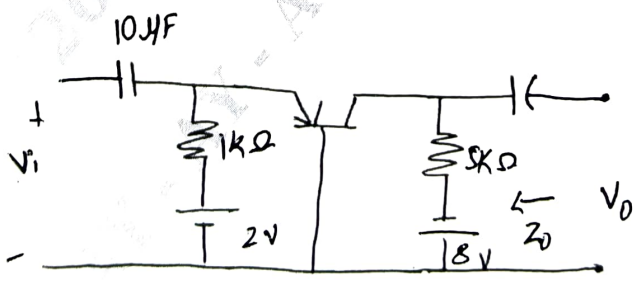
CBCS SCHEME

USN | | | | | | | | | | BEE303

Third Semester B.E./B.Tech. Degree Examination, June/July 2025
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.	How can a diode circuit be implemented to represented parallel independent clipper, illustrate with circuit equations and waveforms.	10	L2	CO1
	b.	The emitter bias circuit has the following specifications : $I_{cQ} = \frac{1}{2} I_{sat}$, I_{sat} = 8 mA, V_C = 18V, V_{CC} = 18V, β = 110. Determine R_C, R_E and R_B.	10	L3	CO1
		OR			
Q.2	a.	Find the output voltage V out of the clipper circuit shown assuming. i) Diode are ideal ii) V_{on} = 0.7V. For both cases, R_f = 0. Sketch the output waveforms.  Fig.Q2(a)	10	L3	CO1
	b.	Explain the voltage divider bias circuit and derive I_c and V_{CE} and terminal voltages.	10	L2	CO2
		Module – 2			
Q.3	a.	With the help of small signal low frequency transistor model, draw generalized model of the amplifier.	10	L2	CO3
	b.	For the networks shown in below, find – I_E, r_e, Z_i, Z_0, A_V , A_i.  Fig.Q3(b)	10	L3	CO3
		OR			
Q.4	a.	Explain miller effect capacitance. Derive C_{mi}.	10	L2	CO3
	b.	Enumerate on general frequency consideration for a Transistors.	10	L2	CO3

		Module – 3			
Q.5	**a.**	Derive Z_{in} and Z_0 of darlington amplifier also derive A_i and A_V.	**10**	**L4**	**CO3**
	b.	Explain cascade amplifier and explain the overall gain equation.	**10**	**L2**	**CO3**
		OR			
Q.6	**a.**	For a transformer coupled amplifier with $V_{CC} = 12V$, $C_{in} \rightarrow \infty$, $\beta = 100$, $V_{BE} = 0.7V$, $A_i = 0$. Find power supplied to load and power required from supply.	**10**	**L3**	**CO3**
	b.	Write important characteristics of : i) Darlington emitter follower ii) Feedback amplifier.	**10**	**L2**	**CO3**
		Module – 4			
Q.7	**a.**	Explain push-pull circuit with a circuit and derive A_v.	**10**	**L2**	**CO3**
	b.	Draw DC equivalent circuit for class C amplifier and explain.	**10**	**L2**	**CO3**
		OR			
Q.8	**a.**	With a neat circuit diagram explain RC phase shift oscillator and derive equation for frequency.	**10**	**L2**	**CO3**
	b.	The turned collector oscillator circuit used in the local oscillator of radio makes use of LC turned circuit with $L1 = 58.6\mu H$, $C_1 = 300$ pf calculate oscillation frequencies.	**5**	**L3**	**CO3**
	c.	What are the advantages and disadvantages of using crystal oscillator?	**5**	**L2**	**CO3**
		Module – 5			
Q.9	**a.**	Explain the operation of JFET.	**10**	**L2**	**CO3**
	b.	Derive g_m for n-channel JFET and draw its characteristic curve.	**6**	**L4**	**CO3**
	c.	What are the advantages of FET over BJT?	**4**	**L2**	**CO3**
		OR			
Q.10	**a.**	With a neat circuit diagram for FET – voltage divider bias – derive I_D and $V_{GS(min)}$, $V_{GS(max)}$.	**10**	**L3**	**CO3**
	b.	Derive i_d, μ, g_m for FET amplifier.	**10**	**L3**	**CO3**

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