

(3 Hours)

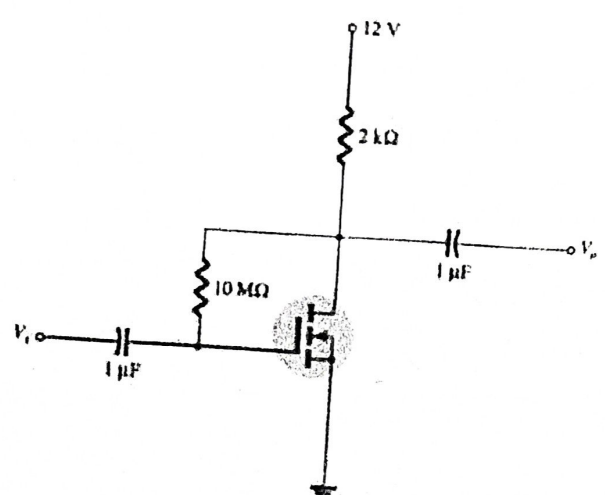
[Total Marks: 80]

N.B.: (1) Question No. 1 is **Compulsory**.(2) Attempt any **three** questions out of the remaining **five**.

(3) Each question carries 20 marks and sub-question carry equal marks.

(4) Assume suitable data if required.

1.	(a)	Explain V-I characteristics of zener diode	(5)
	(b)	Compare BJT and FET	(5)
	(c)	Explain the concept of Thermal Runaway in BJT	(5)
	(d)	With neat sketch explain CLC filter	(5)
2.	(a)	Explain construction, working principle, characteristics and applications of LED.	(10)
	(b)	Explain formation of pn junction diode. Working of diode under forward bias condition. Discuss diode current equation.	(10)
3.	(a)	With neat sketch explain the concept of DC load line and operating point in BJT.	(10)
	(b)	For the given circuit determine Q point values of I_C and V_{CE} . Draw dc load line and mark the Q-point. $V_{CC} = 20V$, $R_1 = 15K\Omega$, $R_2 = 5 K\Omega$, $R_C = 2 K\Omega$, $R_E = 3 K\Omega$, Assume $V_{BE} = 0.7V$, $\beta = 100$.	(10)
4.	(a)	Draw CS D-MOSFET amplifier. With the help of small signal ac equivalent model derive input resistance (R_i), output resistance (R_o) and voltage gain (A_v)	(10)

	<p>(b) Determine I_{DQ} and V_{DSQ} for a given biasing circuit. $I_{D(ON)} = 6\text{mA}$, $V_{GS(ON)} = 8\text{V}$, $V_{GS(TH)} = 3\text{V}$.</p> 	(10)
5	<p>(a) With neat circuit diagram explain the operation of full wave bridge rectifier. Derive expression for ripple factor.</p>	(10)
	<p>(b) A 230 V, 60 Hz voltage is applied to the primary of a 5:1 step down center tapped transformer used in a FWR having a load of 900Ω. If the diode resistance and secondary coil resistance together has a resistance of 100Ω, Determine (a) DC voltage across the load. (b) DC current flowing through the load. (c) DC power delivered to the load and PIV across each diode (d)Ripple voltage and its frequency.</p>	(10)
6.	<p>Write short note on (any two)</p>	(10)
	<p>i) Working principle and characteristics of n channel E-MOSFET</p>	(10)
	<p>ii) Single Electron transistor (SET)</p>	(10)
	<p>iii) Explain types of clipper circuits</p>	(10)