

**VIT**Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act 1956)Vellore – 632014, Tamil Nadu, India
SCHOOL OF ELECTRICAL ENGINEERING
WINTER SEMESTER 2023-2024
CAT-I**SLOT:B1**

Programme Name & Branch : B.Tech (BEL)

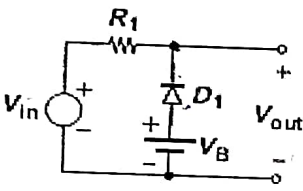
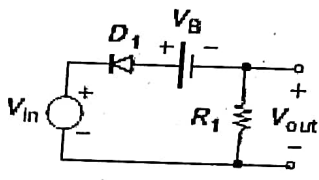
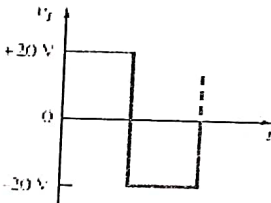
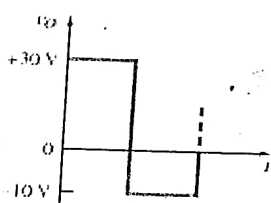
Course Code: BECS201L

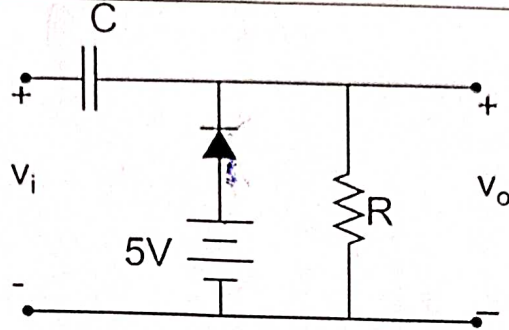
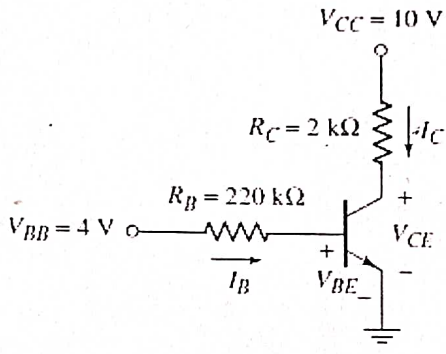
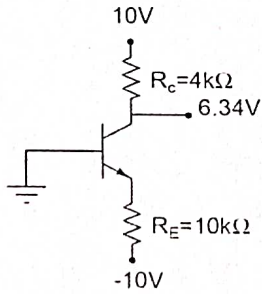
Course Name: Semiconductor Devices and Circuits

Faculty Member: Dr.M.N.Venkataraman

Class Number(s) VL2023240503162

Duration : 90 minutes**Max. Marks : 50****General instruction(s):** Take $V_{BE(on)}=0.7V$ and $V_\gamma=0.7V$ for silicon devices.

Q. No	Question	Marks
1.	Sketch the input and output for the circuits in Fig.(1), where $V_{in}=10\sin(\omega t)V$ with 1kHz frequency and $V_B = 4V$. Consider ideal diodes.   Fig.(1)	10
2. a)	The Fig.(2) shows an input-output combination of a clamper circuit. Design the clamper circuit with the silicon diode.   Fig.(2)	10
b)	Sketch the input and output for the clamper circuit shown in Fig.(3). The input is a 10V amplitude sinewave with a frequency of 1kHz. Consider R to be very large, and the diode is ideal.	

	 Fig.(3)	
3.	How are semiconductors different from metals and insulators? What property of semiconductors deems it important for electronic device design? Compare and contrast intrinsic and extrinsic semiconductors. Explain doping.	5+5
4.	For the circuit shown in Fig.(4), the transistor parameter is $\beta=200$. Find the base, collector, and emitter currents, collector-emitter voltage, and the power dissipated in the transistor.  Fig.(4)	10
5.	For the circuit shown in Fig.(5), determine the base, collector, and emitter currents, and the collector emitter voltage. Find the transistor β.  Fig.(5)	10