Total number of printed pages: **02**

Programme(D)/3rd Semester/DECE 302

2023

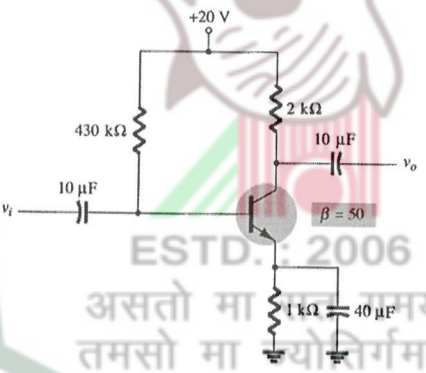
Electronics Devices & Circuits

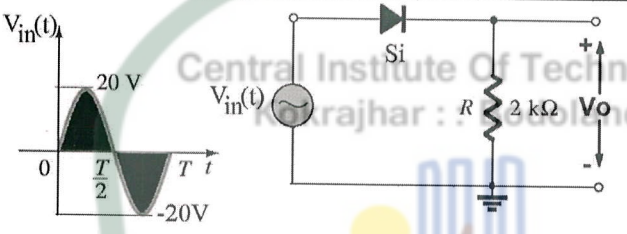
Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Why Biasing is used for a Transistor. What are different types of biasing configuration available for a transistor?	[3+2+2]
	b)	Draw a neat diagram of collector feedback bias and potential divider bias for an NPN transistor. Derive expression of the Base current and the collector current in each case. Draw the DC load line in each case.	[5+5+3]
2.	a)	 Identify the type of biasing. Calculate base current I_B, and collector current I_C, V_{CE}, and V_C for the above circuit.	[1+9]
	b)	Draw a neat sketch of Field effect transistor along with its biasing arrangement. Draw its input and output characteristic curves and explain its operation.	10
3	a)	The input impedance of FET is higher than BJT, explain why? Why BJT is current controlled device and a FET is voltage controlled.	[2+2]
	b)	Draw the symbols of a depletion type MOSFET and an enhancement type MOSFET. How do they differ? Draw the input and output characteristic of MOSFET device and explain its operation.	[2+2+ 2+10]
4.	a)	Write the full form of UJT. What are the names of the terminals of a UJT?	[1+2+2]

		How it is different from a BJT.	
	b)	Draw the characteristic curve of the UJT. Explain different regions in the characteristic curve and their importance. State a few applications of UJT.	15
5.	a)	Draw the cross section of a DIAC and explain its operation with its characteristic curve	10
	b)	Draw the neat diagram of the circuit diagram of a proximity detector using DIAC and explain how it works.	10
6.	a)	Draw the block diagram for the AC-DC conversion? Explain why Full wave rectifiers are used for rectification? Explain the full wave rectifier for the full input AC Cycle.	[2+2+6]
	b)	 I. For the rectifier configuration shown in Fig. 2, find the average value, *rms* value of the output. II. Draw the output waveform of the rectifier. Find the ripple factor and PIV of the rectifier.	[5+5]
7.	a.	What do you mean by breakdown in *pn* junction? Explain the zener and avalanche mechanisms of breakdown	[2+6]
	b.	What do you mean by the depletion layer and explain how it is formed in a *pn* junction.	[2+5]
	c.	Draw the diode circuit for the logical OR operation and explain it's operation for the '1', '0' input	5