K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

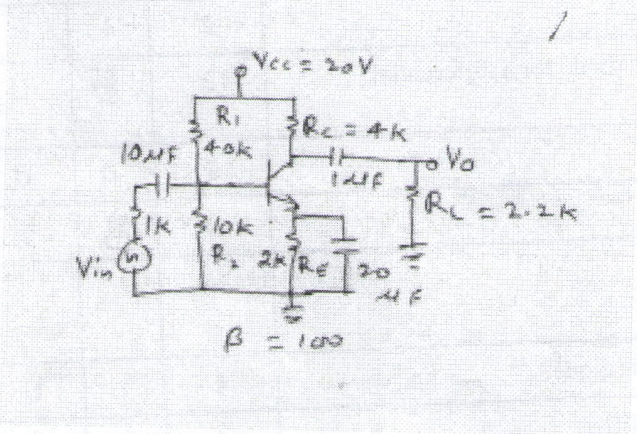
DSY.

Nov – Dec 2023
(B.Tech) Program: EXTC Scheme: II
Examination: SY Semester: III
Course Code: EXC303 and Course Name: Electronic Devices and Circuits

Date of Exam: 04/12/2023 Duration: 2.5 Hours Max. Marks: 60

Instructions:
(1)All questions are compulsory.
(2)Draw neat diagrams wherever applicable.
(3)Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight.	12		
i)	Sketch P-N junction showing depletion region. Briefly explain how depletion region is created.	2	1	U
ii)	Draw circuit diagram of MOSFET amplifier with voltage divider biasing.	2	2	U
iii)	State circuit diagram of dual input balanced output differential amplifier.	2	4	U
iv)	Sketch frequency response of CS amplifier and indicate low cut off frequency, high cut off frequency and bandwidth.	2	4	U
v)	Draw circuit diagram of BJT as a switch.	2	4	U
vi)	Define differential mode gain and Common mode for a differential amplifier.	2	5	U
vii)	Explain miller effect?	2	6	U
viii)	State advantages of multistage amplifiers.	2	3	U
Q.2	Solve any four questions out of six.	16		
i)	Explain difference between silicon and zener diode?	4	1	U
ii)	Explain concept of DC load line for the amplifier.	4	3	U
iii)	Draw circuit diagram of CS MOSFFET amplifier .Sketch input and output waveform when 50 millivolts sine wave is applied as an input. What are its applications?	4	4	U
iv)	A silicon PN junction has a reverse saturation current of I0 = 30 nA at temperature of 300 degree Kelvin. Calculate junction current for applied voltage is a) 0.7 Volts forward bias b) 10 volts reverse bias.	4	6	U

v)	State and explain diode current equation? State four applications of diode.	4	3	U
vi)	Draw and explain construction, working and characteristics of EMOSFET.	4	5	U
Q.3	Solve any two questions out of three.	16		
i)	Compare MOSFET and BJT amplifiers.	8	4	Ap
ii)	Explain drift and diffusion current, depletion and diffusion capacitance for PN junction?	8	6	U
iii)	What are different types of coupling methods used in multistage amplifiers? State its advantages, disadvantages and applications..	8	5	U
Q.4	Solve any two questions out of three.	16		
i)	Draw circuit diagram and explain the operation two transistor current source	8	4	U
ii)	Draw small signal equivalent circuit of CS amplifier with unbypassed Rs and derive the equation of voltage gain, input and output resistance.	8	2	U
iii)	Determine low cut off frequency for the amplifier shown below Vcc=18 Volts, β =100, V_{BE}= 0.7V 	8	2	Ap

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