K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-I Winter2024	
Exam Seat No.:	
Academic Year:2024-2025	Semester:III
Class:SY	Program:B.Tech
Branch Code:ETC	Pattern:2023
Name of Course:Electronic Devices and Circuits	Course Code:2302202
Max. Marks:30	Duration:1.15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 1 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.

		Marks	CO
Question No. 1			
1 a)	Compare MOSFET with Bipolar Junction Transistor. Draw and describe the n-channel enhancement MOSFET's drain characteristics.	(7)	CO1
Question No. 2			
2 a)	Draw small signal AC equivalent model of MOSFET. An n-channel MOSFET has the threshold voltage value of 1 V and channel width to length ratio is 38. If ($½*\mu_n*C_{ox}$)= 22 $\mu A/V^2$ and drain current value is 1.2 mA, what will be the value of k_n and trans-conductance of the MOSFET?	(8)	CO1
	OR		
2 b)	Analyze drain current and drain to source voltage of MOSFET CS circuit with voltage divider biasing without R_s. Consider n –channel MOSFET. Assume EMOSFET has the threshold voltage of 1V and Kn is 0.1 mA/V^2. The circuit is connected with DC power supply of 5V. R_1 is 30KΩ, R_2 is 20 KΩ and drain resistance of 10 KΩ is connected. Find power dissipated in transistor.	(8)	CO1
Question No. 3			
3 a)	With the help of diagram, describe various topologies of negative feedback amplifier. What is the effect of feedback on input and output resistances for all four topologies?	(7)	CO2
Question No. 4			
4 a)	In Colpitts oscillator using FET, the frequency of oscillations is observed to be 2.5 Mhz. Oscillator uses L=10μH , C_1=0.02 μF. Find 1. value of C_2 2. If L is doubled ,the new value of frequency.	(8)	CO2
	OR		
4 b)	Draw ideal frequency response of any amplifier. An amplifier has mid frequency gain of 100 and bandwidth of 200 KHz. 1. What will be new bandwidth and gain if 5% negative feedback is introduced? 2. What should be the amount of feedback, if the bandwidth is to be restricted to 1 MHz?	(8)	CO2

End of question paper