



Daffodil International University  
**Department of Computer Science and Engineering**  
 Faculty of Science & Information Technology

Final Examination, Fall 2024

Course Code: CSE215/224 Course Title: Electronic Devices and Circuits

Level: All Term: All Batch: All

Time: 2 Hours

Full Marks: 40

Answer all the following three questions  
 [All portions of each question must be answered sequentially]

Q1.	a.	Write a short note on depletion mode and enhancement mode operation of MOSFET.	5x1 =5	CO1
	b.	Define Transistor Biasing.		
	c.	Write a short note on an OP-AMP.		
	d.	Define Bandwidth.		
	e.	Why is an oscillator better than an alternator for frequency generation?		
Q2.	a.	Compare among the BJT, FET and MOSFET.	3x5 =15	CO2
	b.	Explain the principles of negative voltage feedback in amplifiers.		
	c.	Explain the operation of the tank circuit in detail.		
Q3.	a.	For a certain D-MOSFET, $I_{DSS} = 10 \text{ mA}$ and $V_{GS}(\text{off}) = -8 \text{ V}$ . (i) Is this an n-channel or a p-channel? (ii) Calculate $I_D$ at $V_{GS} = -3 \text{ V}$ . (iii) Calculate $I_D$ at $V_{GS} = +3 \text{ V}$ .	4x5 =20	CO3
	b.	A Transistor is biased using Voltage Divider Biased Method, where $R_1=10\text{K}\Omega$ , $R_2=10\text{K}\Omega$ , $R_C=1\text{K}\Omega$ , $R_E=5\text{K}\Omega$ , $V_{CC}=10\text{V}$ .  <b>Solve to Find:</b> (i) Emitter Current of the circuit (ii) Calculate $V_{CE}$ (iii) also calculate Voltage at Collector terminals		
	c.	When negative voltage feedback is applied to an amplifier of gain 1000, the overall gain falls to 50. (i) Calculate the fraction of the output voltage feedback. (ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 25.		
	d.	Design an oscillator which can generate a frequency of 1KHz, if the following information are available : One inductor of 1000mH and feedback fraction, $m_v = 0.1$ . Also draw the feedback circuit only.		