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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, IDSS = 10 mA and VGS (off) = – 8V. (i) Is this an n-channel or a p-channel? (ii) Calculate ID at VGS = – 3V. (iii) Calculate ID at VGS = + 3V.	4x5 =20	CO3
	b.	A Transistor is biased using Voltage Divider Biased Method, where R_1=10KΩ, R_2=10KΩ, R_C=1KΩ, R_E=5KΩ, V_{CC}=10V. **Solve to Find:** (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.		

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