Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Summer 2025
Course Code: CSE215, Course Title: Electronic Devices and Circuits
Level: 2 Term: 2 Batch: 66

Time: 02:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	**Name** the components in a practical circuit of a transistor amplifier.	[1]	CO1
	b)	**Recall** 3-db frequency.	[1]	
	c)	**Define** unipolar transistor.	[1]	
	d)	**List** down the characteristics of an ideal operational amplifier.	[1]	
	e)	**Write** a short note on CMOS.	[1]	
2.	a)	**Explain** in detail the operation of a tank circuit and the process through which undamped oscillations are achieved within it.	[5]	CO2
	b)	Differentiate between positive and negative feedback in amplifiers with respect to phase relation between input and feedback signals. **Illustrate** the answer with diagrams.	[5]	
	c)	**Demonstrate** the construction and working of a JFET with neat diagrams.	[5]	
3.	a)	For a Hartley Oscillator, the values of the inductors are L_1= 1000 µH, L_2= 100 µH, and the capacitance is C= 20 pF. The mutual inductance between the coils is M= 40 µH. If the output voltage developed across L_1 is 10 V, **Solve** for the following: (i) The operating frequency of the oscillator. (ii) The feedback voltage developed across L_2.	[4]	CO3
	b)	An amplifier rated at 80W output is connected to a 5Ω speaker. **Solve** for the value of (i) Calculate the input power required for full power output if the power gain is 29 db. (ii) Calculate the input current for rated output if the amplifier current gain is 38 db.	[4]	
	c)	An amplifier has an open-loop gain of 100,000. A negative feedback of 10 db is applied. If due to ageing, the amplifier gain falls to 80,000; **Solve** for the value of (i) Voltage gain with feedback (ii) Value of feedback fraction (iii) The percentage reduction in stage gain without feedback.	[6]	
	d)	A silicon transistor with β = 150 is biased with a V_{CC} of 9V using the fixed-bias method, with R_B = 415 kΩ and R_C = 2 kΩ. **Solve** the biasing circuit for (i) Draw the proper bias circuit (ii) Determine the operating point and (iii) The load line.	[6]	