

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/
COMMERCIAL PRACTICE, NOVEMBER - 2024**

ELECTRONIC CIRCUITS

[Maximum marks: 75]

[Time: 3 Hours]

PART A

I. Answer all the following questions in one word or one sentence. Each question carries 1 mark.

(9 x 1 = 9 Marks)

		Module outcome	Cognitive level
1	A transistor is operating in active region. What will be the biasing at emitter-base and collector-base junctions?	M1.03	R
2	When a transistor is said to be in a quiescent state?	M1.01	R
3	Write the relation between Resonance frequency, Q and Bandwidth.	M2.01	R
4	What is collector efficiency of the power amplifier?	M2.03	R
5	Write the expression for gain of a positive feedback amplifier.	M3.01	R
6	What is piezo electric effect?	M3.05	R
7	Which operating regions of a transistor is used, to work as a switch?	M4.01	R
8	Which multivibrator is known as a free running oscillator?	M4.02	R
9	Name the circuit which converts an irregular waveform to a square wave.	M4.04	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks.

(8 x 3 = 24 Marks)

		Module outcome	Cognitive level
1	A silicon transistor is biased with fixed bias method. If $\beta=100$, $V_{BE}=0.7V$, zero signal collector current $I_c = 1 \text{ mA}$ and $V_{cc} = 6V$, What is the value of the base resistor R_B ?	M1.01	A
2	A multistage amplifier consists of three stages. The voltage gains of the stages are 40, 60 and 80. Calculate the overall voltage gain in dB.	M1.04	A
3	What is resonant frequency? Derive the expression for resonant frequency of a series resonant circuit.	M2.01	R
4	Write the importance of impedance matching in power amplifier. Suggest a method for impedance matching.	M2.03	U
5	Why Class B power amplifier is more efficient than Class A?	M2.04	U
6	Write the effect of negative feedback on an amplifier.	M3.03	U
7	Calculate the resonant frequency of a Wien Bridge oscillator when $R = 100 \text{ k } \Omega$ and $C = 500\text{pF}$.	M3.04	A

8	Draw the circuit of a Hartley oscillator.	M3.05	U
9	For an un-symmetric astable multivibrator $R_1 = 100\text{ k}\Omega$, $R_2 = 100\text{ k}\Omega$, $C_1 = 0.02\mu\text{F}$, $C_2 = 0.01\mu\text{F}$. Find the frequency of oscillation.	M4.02	A
10	For the UJT relaxation oscillator circuit, resistor $R=10\text{K}$, and $\eta=0.5$. If the required oscillating frequency is 1.5 kHz , find the value of C .	M4.05	A

PART C

Answer all questions. Each question carries seven marks.

(6 x 7 = 42 Marks)

		Module outcome	Cognitive level
III	Draw and explain the operation of an Emitter follower Circuit. Mention any of its important feature.	M1.03	U
	OR		
IV	Explain the operation of transformer coupled amplifier with circuit diagram.	M1.04	U
V	Explain the series and parallel resonance circuit with diagram. Find out the resonant frequency of a parallel resonant circuit formed by a $100\mu\text{H}$ inductor and a $2\mu\text{F}$ capacitor.	M2.01	A
	OR		
VI	List and explain different classes of power amplifiers.	M2.04	R
VII	Differentiate between voltage amplifier and power amplifier.	M2.03	R
	OR		
VIII	Explain the operation of Class B Push Pull amplifier with circuit.	M2.04	U
IX	A phase shift oscillator uses 5 pF capacitors. Find the value of R to produce a frequency of 800 kHz . Draw the circuit diagram and mark the feedback network.	M3.04	A
	OR		
X	The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with $L_1 = 58.6\text{ }\mu\text{H}$ and $C_1 = 300\text{ pF}$. Calculate the frequency of oscillation.	M3.04	A
XI	Explain working of Colpitts oscillator with circuit diagram.	M3.05	U
	OR		
XII	What is meant by feedback? Compare positive and negative feedback.	M3.01	R
XIII	Draw a Schmitt trigger circuit and show its input and output waveforms.	M4.04	U
	OR		
XIV	Explain the working of UJT Relaxation oscillator with circuit and waveforms.	M4.05	U
