Reg. No.																	

Question Paper Code	14218

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

Fourth Semester

Electronics and Communication Engineering

20ECPW401 - ELECTRONIC CIRCUITS WITH LABORATORY

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following is used to determine the operating point of a transistor in a circuit? (a) AC load line (b) DC load line (c) Power curve (d) Output curve	1	K1	CO1
2.	Choose the following stability factors (S) is the best indicator of bias stability in a transistor circuit? (a) S > 1 (b) S = 1 (c) S <1 (d) S = 0	1	K1	CO1
3.	Identify the amplifier configuration is most commonly used for impedance matching? (a) Common Emitter (CE) (b) Common Base (CB) (c) Common Collector (CC) (d) Differential Amplifier	1	K1	CO2
4.	Infer the frequency response of an amplifier typically depends on: (a) The input impedance only (b) The output impedance only (c) The parasitic capacitances, inductances, and the circuit components (d) The power supply voltage	1	K2	CO2
5.	Select the feedback configuration involves applying a feedback current in parallel with the input signal? (a)Voltage series feedback (b) Voltage shunt feedback (c) Current series feedback (d) Current shunt feedback	1	K1	CO3
6.	The Barkhausen criterion for oscillations requires: (a) A phase shift of 90° and a gain of 1 (b) A phase shift of 180° and a gain of 1 or greater (c) A phase shift of 180° and a gain of 2 (d) A phase shift of 360° and a gain of 2	1	K1	CO3
7.	What is the primary purpose of neutralization in tuned amplifiers? (a) To increase the gain of the amplifier (b) To cancel out the effects of parasitic capacitance (c) To stabilize the frequency response at high power (d) To reduce the input impedance of the amplifier	1	K1	CO4
8.	Identify the multivibrator configuration is commonly used for frequency division and pulse generation? (a) Astable multivibrator (b) Monostable multivibrator (c) Schmitt trigger (d) Bistable multivibrator	1	K1	CO4
9.	Identify the configuration of multivibrator is most suitable for switch debouncing? (a) Monostable (b) Astable (c) Bistable (d) None of the above	1	K1	CO5
10.	Which amplifier class minimizes crossover distortion? (a) Class A (b) Class B (c) Class AB (d) Class C	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

11.	Define the operating point (Q-point) of a transistor.	2	K1	CO1
12.	Show the purpose of emitter resistor in biasing.	2	K1	CO1
13.	What is an AC load line?	2	K1	CO2

14.	Find CMRR of differential amplifier with differential gain 300 and common mode gain of 0.2.	2	K1	CO2
15.	Recall negative feedback and its effect on amplifier performance.	2	K1	CO3
16.	Identify the role of the tank circuit in tuned oscillator designs.	2	K2	CO3
17.	How does cascading affect the bandwidth of tuned amplifiers?	2	K1	CO4
18.	What is neutralization in amplifiers?	2	K1	CO4
19.	A monostable multivibrator has an R = 100 kΩ and C = 0.01 μF. Calculate the pulse width of the output.	2	K2	CO5
20.	What is hysteresis in a Schmitt Trigger?	2	K1	CO5
21.	Infer crossover distortion in push-pull amplifiers.	2	K2	CO6
22.	How does Class C amplifier achieve high efficiency?	2	K1	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Infer voltage divider bias configuration. Draw the circuit diagram and derive the expression for collector current and stability factor.	11	K2	CO1
		OR			
	b)	Outline the term bias stabilization and explain the concept of thermal runaway and methods to prevent it.	11	K2	CO1
24.	a)	Explain the basic common emitter amplifier circuit and derive the expressions for its small signal voltage gain, current gain, input impedance and output impedance.	11	K2	CO2
		OR			
	b)	Explain the operation of cascade amplifier and derive voltage gain, overall input resistance, overall current gain and output impedance.	11	K2	CO2
25.	a)	Compare and explain the four basic feedback topologies: Voltage series, Voltage shunt, Current series, and Current shunt, with suitable examples.	11	K2	CO3
		OR			
	b)	Draw the Circuit diagram of Wien Bridge oscillator and derive the expression for the frequency of Oscillations.	11	K2	CO3
26.	a)	Illustrate the frequency response of a double tuned amplifier. Explain how mutual inductance affects bandwidth.	11	K2	CO4
		OR			
	b)	Apply the concept of stagger tuning. How does it help in improving the bandwidth of tuned amplifiers?	11	K2	CO4
27.	a)	Illustrate the advantages of neutralization in high-frequency amplifiers? Explain with examples.	11	K2	CO5
		OR			
	b)	Illustrate the function of emitter coupled monostable Multivibrator and triggering methods for monostable multivibrator.	11	K2	CO5
28.	a)	Show the single-ended power amplifier and derive expressions for output power and power dissipation.	11	K2	CO6
		OR			
	b)	Illustrate the function of complementary symmetry push-pull amplifier circuit and its operation in detail.	11	K2	CO6