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Question Paper Code	12374
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023**  
Fourth Semester  
**Electronics and Communication Engineering**  
**20ECPW401 - ELECTRONIC CIRCUITS WITH LABORATORY**  
(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

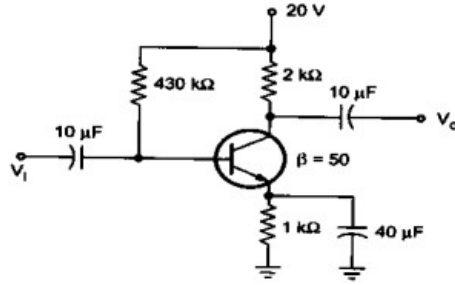
Answer ALL Questions

- |   | <i>Marks,<br/>K-Level, CO</i> |
|---|-------------------------------|
| 1. List out the various biasing methods.  | 2,K1,CO1                      |
| 2. List the two techniques used in the stability of the Q point.  | 2,K1,CO1                      |
| 3. Compare cascade and cascode amplifier.   | 2,K2,CO2                      |
| 4. Categorize the different coupling schemes used in multistage amplifiers.   | 2,K2,CO2                      |
| 5. State the advantages of negative feedback  | 2,K1,CO3                      |
| 6. A Wein bridge oscillator has feedback network with capacitance of $10\mu\text{F}$ and resistance of $5\text{ k}\Omega$ .find the frequency of oscillation. | 2,K3,CO3                      |
| 7. What is meant by Tuned amplifier?  | 2,K2,CO4                      |
| 8. List out some advantages of double tuned amplifier.  | 2,K1,CO4                      |
| 9. State the differences between voltage and power amplifier.   | 2,K1,CO6                      |
| 10. What is meant by complementary symmetry push pull amplifier   | 2,K1,CO6                      |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) (i) What is DC load line? How will you select the operating point, explain it using common emitter amplifier characteristics as an example? 8,K2,CO1
- (ii) Design a fixed bias circuit to have operating point of (10V,3mA). The circuit is supplied with 20V and uses a silicon transistor of  $h_{fe} = 250$ . 5,K3,CO1
- OR**
- b) (i) Find the stability factor for voltage divider bias circuit and give reason why it is advantageous than fixed bias circuit. 8,K2,CO1
- (ii) Determine  $I_B$ ,  $I_C$ ,  $V_{CE}$ ,  $V_C$ ,  $V_B$ ,  $V_E$  and  $V_{BC}$  For the emitter bias network shown below. 5,K3,CO1



12. a) Explain the basic common base amplifier circuit and derive the expressions for its small signal voltage gain, current gain, input impedance and output impedance. 13,K2,CO2

**OR**

- b) Illustrate the expressions for  $R_i$ ,  $A_v$  and  $R_o$  for emitter follower amplifier. 13,K2,CO2

13. a) (i) What are the different topologies of negative feedback amplifier 3,K2,CO3  
(ii) With a neat diagram, derive the expression of  $R_{if}$ ,  $R_{of}$ ,  $A_v$ , and  $A_{vf}$  of the Voltage series feedback amplifier. 10,K2,CO3

**OR**

- b) (i) State the advantages of Crystal oscillator 3,K2,CO3  
(ii) Derive the expression for condition for oscillation and frequency of oscillation of RC phase shift oscillator 10,K2,CO3

14. a) (i) List out need for neutralization in tuned amplifiers. 3,K2,CO4  
(ii) Obtain the bandwidth of a n-stage cascaded identical single tuned amplifiers in terms of the bandwidth of a single stage tuned amplifier. 10,K2,CO4

**OR**

- b) Describe and derive the equations for the Small signal tuned amplifier with necessary derivations. 13,K2,CO4

15. a) Examine the circuit operation and output resistance of class AB power amplifiers. 13,K2,CO6

**OR**

- b) Summarize the transfer characteristic, signal waveforms, power dissipation, power conversion efficiency of Class A amplifier. 13,K2,CO6

**PART - C (1 × 15 = 15 Marks)**

16. a) Explain the working principle of Bistable multivibrator with neat diagrams. 15,K2,CO5

**OR**

- b) Describe how Schmitt trigger circuit can be evolved from bistable circuit. 15,K2,CO5