





10. Match the following List I with List II.

CO5 [K<sub>1</sub>]

| List I                | List II                |
|-----------------------|------------------------|
| A. op-amp             | i. infinite bandwidth  |
| B. ideal op-amp       | ii. inductive feedback |
| C. Hartley oscillator | iii. switch            |
| D. transistor         | iv. IC 741             |

- |    | A  | B  | C   | D   |
|----|----|----|-----|-----|
| a) | i  | ii | iii | iv  |
| b) | iv | i  | ii  | iii |
| c) | iv | ii | iii | i   |
| d) | ii | iv | i   | iii |

**PART B (10 x 2 = 20 Marks)**

(Answer not more than 40 words)

- |  |     |                   |
|--|-----|-------------------|
| 11. State Kirchoff's voltage and current laws.             | CO1 | [K <sub>1</sub> ] |
| 12. What are the classifications of circuit elements?      | CO1 | [K <sub>1</sub> ] |
| 13. Draw the power triangle indicating all the parameters. | CO2 | [K <sub>1</sub> ] |
| 14. Define RMS and average values.                         | CO2 | [K <sub>1</sub> ] |
| 15. Differentiate avalanche and zener breakdowns.          | CO3 | [K <sub>1</sub> ] |
| 16. Draw the V-I characteristics of a practical PN diode   | CO3 | [K <sub>1</sub> ] |
| 17. What do you mean by biasing in a transistor.           | CO4 | [K <sub>1</sub> ] |
| 18. What is mean by saturation region in JFET?             | CO4 | [K <sub>1</sub> ] |
| 19. Draw the pin configuration of IC 741.                  | CO5 | [K <sub>1</sub> ] |
| 20. Draw the circuit of a summing amplifier using op-amp.  | CO5 | [K <sub>1</sub> ] |

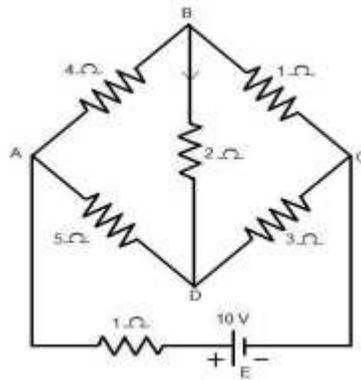
**Answer any FIVE Questions:-**

**PART C (5 x 14 = 70 Marks)**

(Answer not more than 300 words)

**Q.No. 21 is Compulsory**

21. i) A coil having a resistance of  $5\Omega$  and inductance of  $30\text{ mH}$  in series are connected (7) CO2 [K<sub>2</sub>]  
across a  $230\text{ V}$ ,  $50\text{ Hz}$  supply. Calculate current, power factor and power consumed.
- ii) In the circuit shown in figure 1 determine the current through the  $2\text{ ohm}$  resistor (7) CO1 [K<sub>2</sub>]  
and the total current delivered by the battery. Use Kirchoff's laws.



**Figure 1**

22. i) Find the total resistance between A&B terminals for the network shown in (7) CO1 [K<sub>2</sub>]  
figure 2.

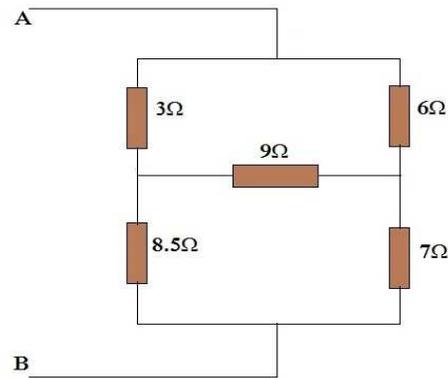


Figure 2

- ii) Use mesh analysis to find  $V_o$  in the figure 3. (7) CO1 [K<sub>2</sub>]

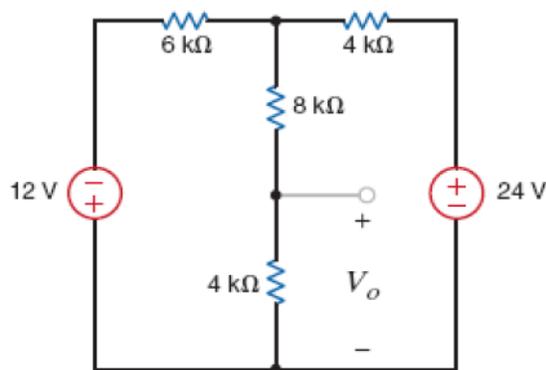


Figure 3

23. i) A coil of  $R=10\ \Omega$ ,  $L=0.023\ \text{H}$  connected in parallel with another coil of  $R=5\ \Omega$ ,  $L=0.035\ \text{H}$ . The combination is connected across a 200 V, 50 Hz supply. Calculate the current drawn from the supply and the power factor. (7) CO2 [K<sub>2</sub>]  
ii) Derive an expression for the power in a three-phase circuit. (7) CO2 [K<sub>1</sub>]
24. i) Draw and explain with neat waveforms, the circuit of a full wave rectifier with resistive load. (7) CO3 [K<sub>1</sub>]  
ii) Draw the energy band diagram and explain the working of a pn junction diode. (7) CO3 [K<sub>1</sub>]
25. i) Draw the circuit of a CE amplifier with coupling and bypass capacitors and explain its operation. (10) CO4 [K<sub>1</sub>]  
ii) Write short notes on SCR. (4) CO4 [K<sub>1</sub>]
26. Draw the circuit diagram of op-amp differentiator, integrator and derive an expression for the output in terms of the input. CO5 [K<sub>1</sub>]
27. Explain the working of wien bridge oscillator with neat diagram. CO5 [K<sub>1</sub>]

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