

Instructions :

- i) Question paper contains four parts.
- ii) Part-A is compulsory.
- iii) Part-D contains two sub parts I] Problems II] Essay type questions
- iv) Draw the circuit diagram wherever necessary.

Part - A**Answer ALL questions.****10x1=10**

1. What is the SI unit of electric power?
2. Is Ohm's law applicable to semiconductor?
3. What is meant by thermistor?
4. What is a low Pass filter?
5. What is a clamper circuit?
6. Draw the symbol of Schottky diode.
7. Which region of the transistor is largest in size?
8. Draw the symbol of phototransistor.
9. Define NAND gate.
10. Write 1's complement of $(1011)_2$.

Part - B**Answer any FIVE questions.****5x2=10**

11. What is a pulse oximeter and ultrasound scan?
12. Mention any two applications of an oscilloscope.
13. Show the graphical and phasor diagram representation of the phase relation between the voltage and current in an ac circuit containing only pure inductor.
14. What is an intrinsic and Extrinsic semiconductor?
15. Mention the majority and minority charge carriers in n-p-n transistor.
16. The current gain of a transistor in CE mode is 200. Calculate the collector current when the base current is $20\mu\text{A}$.
17. Simplify the Boolean expression $A = A.B + A.(B+C)$
18. Multiply $(101)_2$ with $(111)_2$.

Part - C**Answer any FIVE questions.****5x3=15**

19. a) Mention any two communication applications of electronics.
b) Expand SCR
20. Mention any three properties of electrical charges.
21. An ac voltage in volts is given by $V=310 \sin 314t$. Find the frequency, average voltage and rms voltage.
22. Derive an expression for effective resistance of two resistors connected in parallel.
23. With a circuit diagram, briefly explain the working of series inductor filter.
24. With a diagram, briefly explain the formation of depletion region in the unbiased semiconductor diode.
25. Mention any three applications of LED.

(P.T.O.)

26. a) Expand PCB
b) Mention any two advantages of PCB.

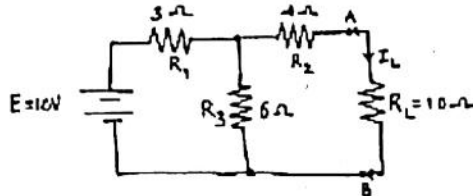
1+2

Part - D

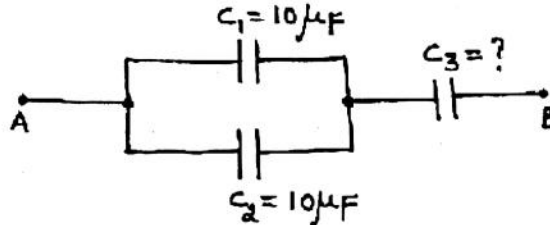
I. Answer any THREE questions.

3x5=15

27. Using Thevenin's theorem find the current through $R_L=10\Omega$



28. Calculate the capacitance of the capacitor C_3 in the given capacitive circuit, if the equivalent capacitance of the combination between A and B is $15\mu F$.



29. An unknown capacitor, a 5Ω resistor and an inductor of 50mH are in series with an ac source of 100V , 50Hz . It is found that the current is in phase with voltage. Determine
i) Capacitance of unknown capacitor ii) Impedance of the circuit.
iii) Current in the circuit.
30. For a zener diode voltage regulator with applied voltage of $V_s=10\text{V}$, series resistor of $R_s=50\Omega$, Zener diode with zener voltage $V_z=6\text{V}$ and load resistor $R_L=390\Omega$, Zener diode with zener voltage $V_z=6\text{V}$ and load resistor $R_L=390\Omega$. Determine
i) Load voltage ii) Voltage drop across series resistance
iii) Current through the zener diode and iv) $R_{L(\text{min})}$
31. Subtract $(111)_2$ from $(1111)_2$ using 2's complement method. Also verify the same by direct subtraction method.

II. Answer any FOUR questions.

4x5=20

32. a) State and explain Ohm's law.
b) Determine the resistance value of an electrical appliance marked with 220V , 550W . 3+2
33. a) Briefly explain the construction and working of transformer.
b) Does a transformer work on DC? 4+1
34. Explain the construction and working of moving coil type loud speaker.
35. a) With a circuit diagram and graph, Explain the growth of current in a RL circuit.
b) Define quality factor in an ac circuit. 4+1
36. With a circuit diagram showing input and rectified output signal wave forms, briefly explain the working of a full - wave bridge rectifier.
37. With the help of circuit diagram and truth table explain the working of two input diode OR-gate.