

SUBJECT: Electronics
MAXIMUM MARKS: 70

Time: 3 hours

Design of model Paper

| Type of Questions | Weightage of Marks | No. Of Questions | Total Marks |
|-------------------------------------|--------------------|------------------|-------------|
| MCQ'S | 01 | 05 | 05 |
| Very Short Answer type Questions I | 02 | 05 | 10 |
| Very Short Answer type Questions II | 03 | 12 | 36 |
| Short Answer type Questions II | 04 | 01 | 04 |
| Long Answer type Questions | 05 | 03 | 15 |

Objective Type Questions

5x1 mark each

- Which of the following is used as a passive component in a circuit?
 - Transistor
 - Diode
 - Resistor
 - None
- In an R-L circuit, the voltage
 - Lags the current
 - Leads the current
 - Neither leads nor lags the current
 - None of the above
- While calculating R_{th} constant-current sources in the circuit are
 - Replaced by opens
 - Replaced by shorts
 - Treated in parallel with other voltage sources
 - Converted into equivalent voltage sources
- In the forward region of its characteristics, the diode appears as
 - OFF switch
 - a high resistance
 - an ON switch
 - a Capacitor
- When used in a circuit, the zener diode is always
 - forward biased
 - connected in series
 - reverse biased
 - troubled by heating

Very Short Answer Type Questions I 5x2 marks each

6. What is difference between intrinsic and extrinsic semi conductors.
Or
Why Doping is done in Semiconductors
7. What is the RMS value and average value of an a.c. signal
8. The colour code sequence of a resistor is red, brown, orange and silver. What is its resistance?
9. What are the two mechanisms of breakdown in a PN junction
10. Why collector is made larger than emitter and base in a Bipolar junction transistors?

Very Short Answer Type Questions II 12x3=36 Marks

11. Describe the difference between p type and n type Semiconductors. Name the Doping materials used for their construction.
Or
Why is temperature coefficient of resistance negative for Semiconductors
12. What is resistance? What is its unit? Name different types of resistors.
13. The Capacitor of value $12 \mu\text{F}$, $18 \mu\text{F}$ and $15 \mu\text{F}$ are connected in series. What is the resultant capacitance
14. Determine the impedance of LR Series Circuit
15. State Kirchhoff's current law. Explain it by giving an example.
16. State what do you understand by barrier potential across a PN junction. Also explain its significance.
17. What is an LED. Which materials are used for the manufacture of LED's. What are its applications.
18. Draw the circuit diagram of Half Wave Rectifier. What is the peak inverse voltage across the Diode. Draw the output voltage waveform.
19. Define Amplitude, Frequency and Time period of an a.c. signal.
20. Derive a relation for impedance of LCR Circuit.
21. How is diode used as a Clipper. Draw positive and negative diode Clipping Circuits.

22. What are emitter injection efficiency and base transport factor and how do they influence the transistor operation.

Short Answer Type Question

4 marks

23. Differentiate between Conductors, Semi Conductors and Insulators on the basis of energy band theory of solids.

Long Answer Type Questions

3x5 marks each

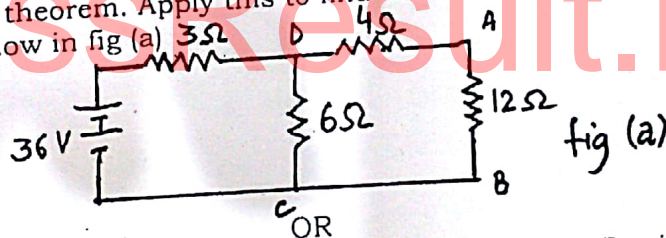
24. Describe the behaviour of Sinusoidal Voltage through the series combination of resistance R and capacitor C.

Or

A resistor of 12Ω , a capacitor of reactance 14Ω and an inductor of inductive reactance 30Ω are joined in series. The combination is connected across 200 V , 50 Hz a.c supply. Calculate

- a) Overall impedance Z
- b) Current I
- c) Power factor

25. State Thevenin's theorem. Apply this to find the current through 12Ω resistor of the circuit given below in fig (a)



OR

State Norton's Theorem. Use this to calculate the current flowing through 12Ω resistor in circuit given in fig (a) above.

26. Draw the Full Wave Rectifier using centre tap connection. Explain its working

Or

Describe the working of a Zener Diode as a voltage regulator.