



JAIN COLLEGE, J C Road Bangalore
Mock Paper January - 2016
I PUC- Electronics (40)

Time: 3 Hours 15 Minutes

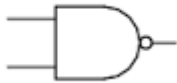
Max. Marks: 70

PART-A

I. Answer all the questions:

1 × 10 = 10

1. Expand EPROM.
2. Write the power relation in terms of current and resistance.
3. What is a glucometer?
4. Define PTC.
5. What is a forbidden energy gap?
6. Draw the symbol of LED.
7. Which region of the transistor is moderately doped?
8. Draw the symbol of PNP transistor.
9. Convert $(10110)_2$ into hexadecimal system.
10. Name the logic gate for the symbol shown below.



PART – B

II. Answer any FIVE questions:

2 × 5 = 10

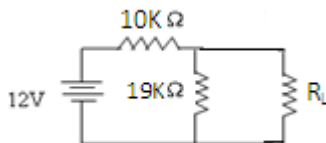
11. Name the two semiconductor materials used in device fabrication.
12. Using source conversion, convert the voltage source into an equivalent current source
Given $V_s = 10V$ and $R_s = 1K\Omega$.
13. What are the advantages of digital thermometer?
14. Draw the graph of an RC transient circuit indicating the time constant during charging of a capacitor.
15. Write a circuit diagram of negative clipper and draw the input and output waveforms.
16. Draw the symbol of tunnel diode and varactor diode. Mention their application.
17. Convert $DAD_{(16)}$ into binary and decimal number system.
18. Subtract $22_{(10)}$ from $33_{(10)}$ using 1's complement method.

PART – C

III. Answer any FIVE questions:

3 × 5 = 15

19. State and explain Kirchhoff's law.
20. Using maximum power transfer theorem, Find the value of load resistor and calculate the maximum power transferred to the load.



21. Explain the construction of wire wound resistor.
22. Derive an expression for resonance in a series LCR circuit.
23. Explain the V-I characteristics of a p-n junction diode with neat waveform.
24. Explain the working of series inductor filter with necessary diagram.
25. A transistor amplifier connected in CE mode has $\beta=100$ and $I_B=20\mu A$. Calculate the values of I_C , I_E and α .

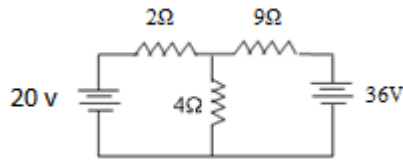
26. Explain the steps involved in PCB designing.

PART – D

IV. Answer any THREE questions:

5 × 3 = 15

27. Find the potential drop across 4Ω resistor in the following circuit using superposition theorem.



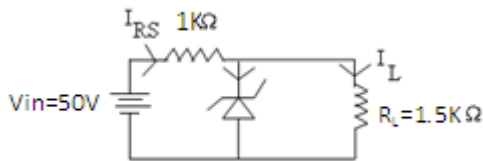
28. Two capacitors of capacitances $15\mu\text{F}$ and $25\mu\text{F}$ are connected in series across 200V DC supply. Find

- a) The equivalent capacitance
- b) The charges on each capacitor
- c) Potential difference across each capacitor.

29. A 10Ω resistance in series with $X_L=50\Omega$ and $X_C=25\Omega$. The applied voltage is $v=50\text{mV}$ with 50Hz. Calculate impedance, current and phase angle between applied voltage and current.

30. For the zener diode voltage regulator shown in the figure, Given $V_Z=12\text{V}$. Find

- (i) Load voltage
- (ii) Voltage drop across the series resistor
- (iii) Current through the diode.



31. a) Simplify the Boolean expression and draw the logic diagram for the simplified expression.

$$Y = \overline{A}BC + A\overline{B}C + ABC + \overline{A}\overline{B}C$$

b) Subtract $54_{(10)}$ from $75_{(10)}$ using 2's complement method.

PART – E

V. Answer any FOUR questions:

5 × 4 = 20

32. a) State and explain Ohms law. Mention its limitation.

b) State voltage divider rule.

33. With a neat diagram, explain the working of a Loudspeaker. Mention any one application.

34. a) Describe with a neat circuit, the growth of current across an inductor in a RL circuit.

b) Draw the phasor diagram of voltage and current in a purely capacitive circuit.

35. With a neat diagram explain the working of center tapped full wave rectifier and draw the input and output waveform.

36. Explain the working of two input diode NAND gate. Write its truth table and timing diagram.

37. a) Explain the output characteristics of a transistor in CE mode.

b) Derive the relation between α and β .
