



JAIN COLLEGE, J C Road Bangalore
Mock Paper January - 2017
I PUC- Electronics (40)

Time: 3 Hours 15 Minutes

Max. Marks: 70

PART-A

I. Answer all the questions:

1 × 10 = 10

1. Expand SCR.
2. What kind of circuit acts as a current divider?
3. What is a pulse oximeter?
4. What is the unit of specific resistance?
5. By what angle does the current lead or lag the voltage when a sinusoidal voltage is applied to a pure capacitance.
6. In which type of biasing is the p-n junction diode resistance high?
7. Write the symbol of tunnel- diode.
8. Write the relation between the current components of a transistor.
9. What is a nibble?
10. Write the Boolean expression for the output of 2 input NOR gate.

PART – B

II. Answer any FIVE questions:

2 × 5 = 10

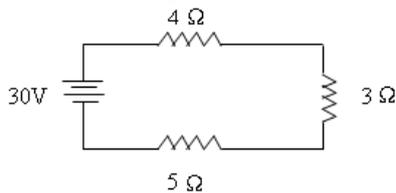
11. Mention any two applications of electronics in the field of defence application.
12. Write the expression for instantaneous voltage of an AC signal and explain its terminals.
13. Mention any four application of an oscilloscope.
14. Explain the factors on which inductance of a coil depend.
15. Draw the crystalline structure of intrinsic semiconductor.
16. What is a positive clipper? Draw the circuit of positive clippers.
17. A transistor has $\alpha=0.9$, if $I_E=10\text{mA}$ calculate the value of I_C and I_B .
18. Write the logic symbol and truth table of 2 input AND gate.

PART – C

III. Answer any FIVE questions:

3 × 5 = 15

19. State and explain maximum power transfer theorem.
20. Find the voltage across each resistor in the circuit given below.



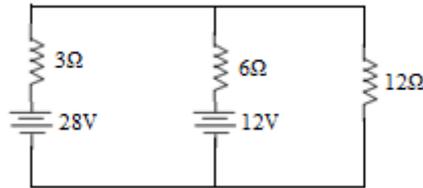
21. Explain the construction electrolytic capacitor with relevant diagram.
22. Derive an expression for resonance frequency of a series resonance circuit and also write the condition for resonance.
23. Classify the solids based on energy band diagram.
24. With a neat circuit diagram, explain the working of a series inductor filter.
25. a) Show that $ABC\bar{C}(AB + \bar{A}C) = ABC\bar{C}$
b) Convert the decimal number $435_{(10)}$ to binary number.
26. Mention any three advantages of PCB.

PART – D

IV. Answer any THREE questions:

5 × 3 = 15

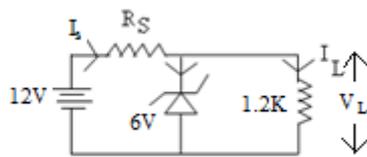
27. Using superposition theorem, find the current through 12Ω resistor.



28. A series RL circuit is connected across the ac supply of 150V, 60Hz. Find the phase angle if R=10Ω and L=40mH. Find

- (i) Impedance of the circuit
- (ii) Current in the circuit
- (iii) Phase angle between applied voltage and current

29. a) For the zener diode voltage regulator circuit, find the value of series resistance R_s , if zener current is 10mA.



b) Two capacitor plates each of effective area $6 \times 10^{-4} \text{ m}^2$ are separated by $1.3 \times 10^{-3} \text{ m}$. Find its capacitance. The space between the plates is filled with air.

30. A half wave rectifier uses a diode with a forward resistance of 50Ω. If the input ac voltage is 200 V_{rms} and the load resistance is of 1KΩ, determine i) I_{dc} and I_{rms} ii) load output voltage iii) DC output power iv) ripple factor v) rectification efficiency

31. Perform the following operations

- i) $111111_{(2)} - 01110_{(2)}$
- ii) $11011_{(2)} \times 110_{(2)}$
- iii) $100011_{(2)}$ by $111_{(2)}$
- iv) Find the 2's complement of $1110111_{(2)}$

PART – E

V. Answer any FOUR questions:

5 × 4 = 20

- 32. a) State and explain Kirchhoff's law.
- b) Mention the properties of charges. (3+2)
- 33. With a neat diagram, explain the working of a microphone. Mention any one application. (4 + 1)
- 34. a) Describe with a neat circuit, the decay of current across an inductor in a RL circuit.
- b) What is transient phenomenon? Write the unit for capacitive reactance. (3+2)
- 35. With a neat diagram and waveform, explain the working of full wave Centre tapped rectifier.
- 36. With a neat circuit diagram and truth table explain the construction and working of DTL NOR gate.
- 37. a) Explain the output characteristics of a transistor in CE mode.
- b) Write any two applications of an IR transistor. (3+2)
