I PUC Annual Examination, March-April - 2022

Time : 3-15 Hrs. **Subject - ELECTRONICS (40)** **Max. Marks : 70**

Instructions

1. **The question paper has four parts A, B, C, & D**
2. **PART-D contains two sub parts**
   (i) Numerical problems
   (ii) Essay type questions
3. **Answer without question number/relevant diagrams / figures wherever necessary will not carry any marks.**
4. **Numerical problems solved without writing the relevant formula carry no marks.**
5. **Read the instructions given for each part**

PART - A

Answer any TEN questions **10x1=10**

1. What is the function of inverter circuit?
2. Define Peak value of an AC?
3. How do you arrange cells to get desired current rating?
4. What is a pulse oximeter?
5. What is the resistance value of SMD resistor printed with 104?
6. Which type of capacitor is sensitive to polarities?
7. Write circuit symbol of variable resistor.
8. Give an expression for the inductive reactance.
9. What is an ideal diode?
10. Under which bias condition does LED eimit light?
11. Define β_{dc} of a transistor.
12. How many PN Junctions a transistor has?
13. Write the Boolean expression of NAND gate.
14. Obtain the 1's compliment of the binary number $(11010010)_2$
15. What is etching?

PART - B

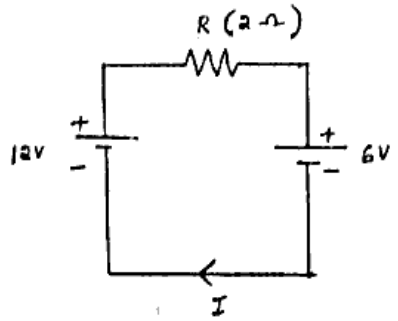
Answer any FIVE questions. **2x5=10**

16. Silicon is more preferred than germanium in semiconductor devices fabrication justify.
17. What are secondary DC sources? Give an example.
18. How DC voltage is measured using CRO?
19. Distinguish between active and passive components.
20. How is energy stored in an inductor? Write its expression?
21. Derive an expression for resonance frequency of series resonance circuit.
22. How many diodes are used in (i) Center tapped full wave rectifier and (ii) Bridge rectifier?
23. Write the circuit diagram of a transistor NOT gate.
24. A transistor has $\alpha = 0.9$, if $I_E = 10mA$, calculate the values of I_C and β
25. Mention the steps involved in PCB designing.

PART - C

Answer any FIVE questions **3x5=15**

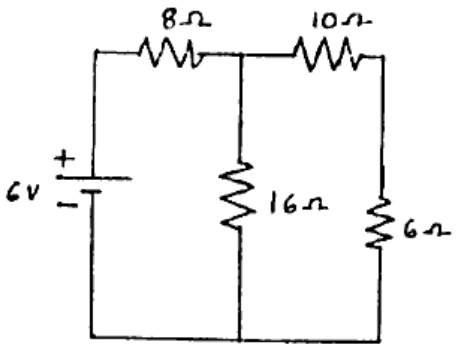
26. Give a brief note on scope of Electronics.
27. Find the current flowing through and voltage across R in the circuit given below using superposition theorem



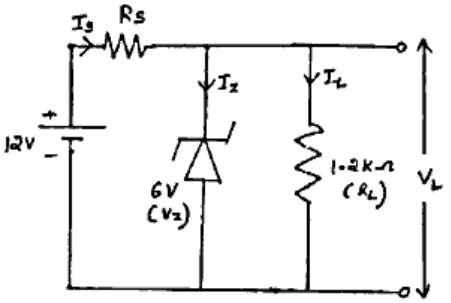
28. Give details of front panel controls of CRO.
29. A 2cm long air core coil with cross-sectional area of $3cm^2$ to has 10 turns. Determine the inductance of the coil.
30. Discuss the growth of current in RL circuit.
31. Briefly explain p-type semiconductors.
32. Explain the working of a p-n junction when it is forward biased.
33. Explain the working of LED.
34. Obtain the relation between α and β of a transistor
35. List 78XX series voltage, regulators.

PART - D

I Answer any THREE questions **5x3=15**



36. Determine the voltage across. 6Ω resistor in the circuit given below using Thevenins theorem.
37. A step down transformer having a power output of 10KW and efficiency 90% reduces the voltage from II KV to 220V. Calculate (i) the number of turns in the primary if secondary has 100 turns (ii) the current in the primary.
38. A 10Ω resistance in series with $X_L = 50\Omega$ and $X_C = 25\Omega$. The applied voltage is V = 50mV with 50Hz, Calculate impedance (z) and current (I) of the circuit.
39. In the circuit. shown in the figure, find the value of series resistance Rs, If zener current is 10mA



40. Subtract $(42)_{10}$ from $(96)_{10}$ using 2's complement method.
41. Simplify the Boolean expiration and draw the logic circuit, for the simplified expression $y = \overline{\overline{A}B + A\overline{B}}$

II Answer any FOUR questions **5x4=20**

42. State and explain superposition theorem.
43. Distinguish between AC and DC current.
44. Describe the construction and working of moving coil loudspeaker.
45. Derive an expression for the equivalent capacitance of three capacitors connected in series.
46. Explain low-pass filter with its frequency response.
47. Explain the working of half wave rectifier. Also draw the input signal and output signal waveforms.
48. With circuit diagrams, explain the forward and reverse V-I characteristics of a semiconductor diode.
49. State and prove De Morgan's theorem.