Jain College, Jayanagar
I PUC Mock Paper, Dec - 2018
Subject: I PUC ELECTRONICS (40)

Duration: 3 hours 15 minutes **Max. Marks: 70**

PART – A

Answer all the questions: **10 × 1 = 10**

1. Who discovered the Electron?
2. What is direction of Conventional Current flow?
3. Expand ECG.
4. State Ohm's law.
5. Define the phase difference between two A.C. quantities.
6. In which type of biasing is the $p-n$ junction Diode resistance is high?
7. Draw the schematic symbol of LED.
8. Why is Transistor called transfer resistor device?
9. How many basic symbols are used in hexadecimal number system?
10. Name the type of Capacitor having Polarity.

PART – B

Answer any *Five* of the following questions: **5 × 2 = 10**

11. Name two semiconductor materials used in device fabrication.
12. Mention any two properties of charges.
13. State Kirchhoff's laws.
14. Identify the resistor values with the four colour bands.
    a) Orange – Orange – Brown – Silver
    b) Red – Red – Red – Gold
15. A $2.5\,mH$ inductor is placed in a circuit, where the frequency is $100\,KHz$ and Voltage is $50\,V$. Calculate reactance and peak current.
16. Write the circuit of series negative clipper and show the input and output waveforms.
17. Write the two applications of IR Transistor.
18. Perform the Binary Addition of the Numbers $(1011111)_2$ and $(111011)_2$.

PART – C

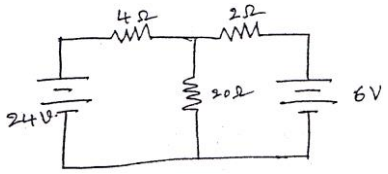
Answer any *Five* of the following questions: **5 × 3 = 15**

19. State and explain voltage divider Rule.
20. Write any three applications of an Oscilloscope.
21. Derive an expression for effective capacitance of three capacitors connected in series.
22. Explain the construction and working of Carbon Microphone with diagram.
23. What is Low Pass Filter? Draw its circuit diagram and frequency response.
24. How is the depletion region formed in a $p-n$ junction?
25. Draw the circuit diagram and explain the working of DTL NAND Gate.
26. Write any three advantages of Data Sheet.

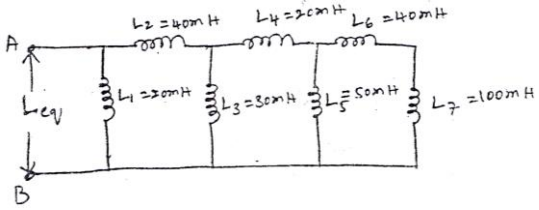
PART – D

Answer any *Three* of the following questions: **3 × 5 = 15**

27. Using Thevenin's theorem, find the current through $20\,\Omega$ resistor of the following circuit.



28. Calculate the equivalent inductance of the following circuit.



29. An inductor of $20\,mH$ is connected in series with a resistor of $50\,\Omega$. The combination is connected to $220\,V - 50\,Hz$ source.
    (i) Find the current in the circuit (ii) Impedance (iii) Phase angle.

30. A $230\,V - 50\,Hz$ AC Voltage is applied to the Primary of $5:1$ step down transformer, which is used in Bridge Rectifier, having a load resistance of $100\,\Omega$. Assuming the Diodes to be an ideal, determine the following:
    (i) I_{dc} (ii) V_{dc} (iii) P_{dc} (iv) PIV

31. Simply the logic expression.
    $Y = AB + AC + A\overline{BC}$ and draw the logic diagram for the simplified expression using basic gates.

PART – E

Answer any *Four* of the following questions: **4 × 5 = 20**

32. With a diagram, explain the construction and working of a loud speaker. Mention one application of microphone.

33. Discuss growth and decay of current in RL circuit.

34. a) Explain the working of a series Inductor Filter with circuit diagram.
    b) Draw the circuit diagram of $+12\,V$ Voltage Regulator. **(3+2)**

35. With a circuit diagram, explain an experiment to draw the forward and reverse bias characteristics of a semiconductor diode. Draw the curves.

36. Subtract $(123)_{10}$ from $(234)_{10}$ using 2's compliment method. (**5)**

37. Draw the circuit diagram of two input DTL NOR gate. Explain its working. Write its truth table and logic symbol.

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