



# JAIN COLLEGE

463/465, 18th Main Road, SS Royal, 80 Feet Road, Raja Rajeshwari Nagar,  
Bangalore - 560 098

Date: 15/1/2018

SUBJECT: Electronics

I PUC  
Mock Examination

Timings Allowed: 3Hr 15 Minutes.

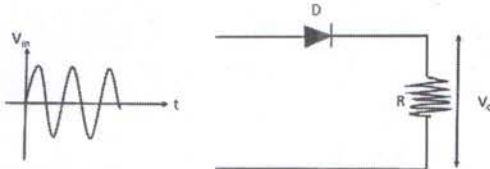
Total Marks: 70

## PART- A

### I. ANSWER ALL THE QUESTIONS:

10 X 1=10

1. What are choppers?
2. What is a linear bilateral network?
3. Define half power frequencies?
4. What is the relation between RMS value and peak value of voltage.
5. Expand ECG.
6. What does the fifth band of a five band colour code resistor indicate?
7. Sketch the output waveform for the given circuit assuming the diode to be ideal.



8. What is an opto-coupler?
9. Write the 2's complement of binary number  $(1111010)_2$
10. Write the logical symbol of a NOT gate with neat labelling?

## PART- B

### II ANSWER ANY FIVE QUESTIONS

05 X 2=10

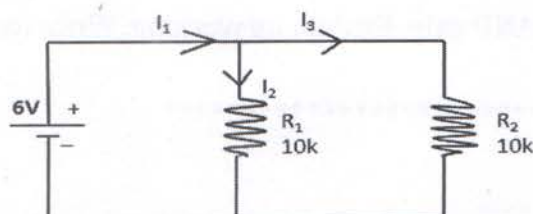
11. What are the job requirements available in the field of electronics?
12. Name the factors on which inductance of a coil depend on.
13. Define inductive reactance and give expression for the inductive reactance?
14. What is the maximum rectification efficiency of a Half wave rectifier and Full wave rectifier?
15. Derive expression for  $\beta$  in terms of  $\alpha$ .
16. A transistor has  $\beta=150$ , and  $I_C=20\text{mA}$ . Calculate  $I_E$ .
17.  $ABCD_{(16)} = \text{_____}_{(2)} = \text{_____}_{(10)}$
18. Write the truth table and sketch timing diagram for NAND gate.

## PART- C

### III ANSWER ANY FIVE QUESTIONS

05 X 3=15

19. Derive an expression for the effective capacitance of two capacitors connected in series.
20. Find the total current flowing in the circuit given below also find the branch currents.



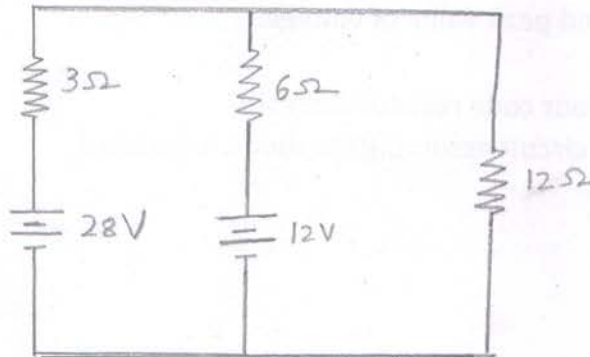
21. Explain any three controls of the multimeter.
22. Explain voltage divider rule.
23. Write a note on Zener breakdown.
24. Write the properties of semiconductors.
25. Explain input characteristics of a transistor in CE mode with neat circuit diagram.
26. Write the steps involved in PCB designing.

**PART- D**

**IV ANSWER ANY THREE QUESTIONS**

**03 X 05=15**

27. Use superposition theorem to find the current through  $12\Omega$  resistor.



28. Three capacitors are connected in series across 75V supply. The voltage across each of them is 20V, 25V and 30V respectively. The charge on each capacitor is 3nC. Find the effective capacitance and also find the individual capacitances.
- 29 a. The time constant of an RC circuit is 25mS. If  $R = 30k\Omega$ . Find the capacitance of the capacitor.  
b. A series resonant circuit has resonant frequency of 45kHz. If  $R = 100\Omega$ ,  $C = 0.01\mu F$ . Find L.
30. For the Zener diode voltage regulator with  $V_S = 20V$ ,  $R_S = 100\Omega$ ,  $V_Z = 12V$ .  $R_L = 680\Omega$   
Determine a) Load voltage b) voltage drop across series resistance and c) current through zener diode.
31. Simplify the given Boolean expression and draw logic diagram for the simplified expression

$$Y = ABC\bar{C} + \bar{A} + ABCD + CD$$

**PART - E**

**V ANSWER ANY FOUR QUESTIONS**

**04 X 05= 20**

32. a) Define i) Linear Network ii) Unilateral Network.  
b) State and explain maximum power transfer theorem.
33. Explain construction and working of microphone.
34. Write a note on three approximations of diode
35. Explain low pass filter with neat circuit diagram, frequency response and phasor diagram.
36. Compare LED and LCD display.
37. Draw the circuit diagram of 2- input DTL NAND gate. Explain its working. Write its logic symbol and truth table.

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