JAIN COLLEGE

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

Date: 08/10/2016 ***SUBJECT: ELECTRONICS***

I PUC

Midterm Examination

Timings Allowed: 3 Hrs15Minutes ***Total Marks:70***

Note: i. Question paper contains **five** parts.
ii. Part **A** is compulsory. Part **D** contains problems
iii. Part **E** contains essay type questions.
iv. Explanation **without** circuit diagram, wherever necessary, does not **carry** mark

PART – A

I.Answer ALL questions. Each question carries ONE mark. **1X10=10**

1. Who invented vacuum tube triode?
2. Mention one application of maximum power transfer theorem.
3. Write the relation between frequency and time period
4. Draw the symbol of variable resistor.
5. Name the majority charge carrier in n-type semiconductor.
6. Draw the symbol of pn junction diode.
7. Mention the lightly doped region of a transistor.
8. Write an application of IR receiver.
9. Write the 1's complement of the binary number $(11011)_2$.
10. Write the output expression of NOR gate.

PART – B

II.Answer any FIVE questions. Each question carries TWO marks. **2X5=10**

11. Mention the limitation of Ohm's law.
12. Draw any two non-sinusoidal waveform.
13. Mention the merits of a multimeter.
14. Name the instruments which measure
    (a) Blood pressure (b) saturation level of hemoglobin
15. Classify both the type of semiconductors.
16. Define conduction band and valance band
17. Convert the decimal number $(23752)_{10}$ to hexadecimal number.
18. Write the truth table of NAND gate and draw the timing diagram.

PART – C

III. Answer FIVE questions. Each question carries THREE marks. **3X5 = 15**

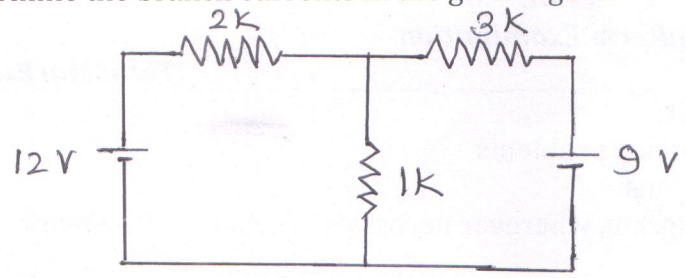
19. Explain voltage divider rule.
20. State and explain the Maximum power transfer theorem.
21. (a) Find the colour code of 220Ω.
    (b) Find the resistance value of orange, orange, red and gold. **(1+2)=3**
22. Explain the construction of ceramic SMD capacitor.
23. Briefly explain about n-type semiconductor.
24. Draw and explain the circuit diagram of forward biased pn junction.
25. Simply the Boolean expression $Y = \overline{\left(A\bar{B}C\right)\left(\overline{A\bar{B}}\right)} + BC$

26. Draw the circuit diagram with input and output waveforms and truth table of transistor NOT gate.

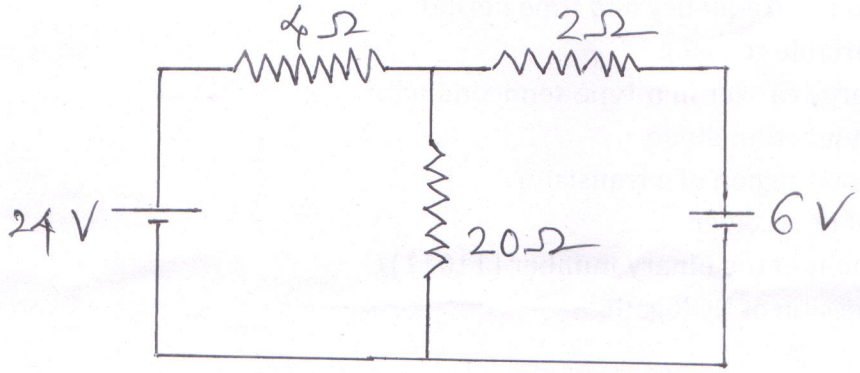
PART – D

IV.Answer THREE questions. Each question carries FIVE marks. **5X3 = 15**

27. Determine the branch currents in the given figure.



28. Using superposition theorem, find the current through 20Ω resistance of the circuit.



29. (a) The resistance of a coil made of copper wire is 100Ω at 0°C. Calculate its resistance at 30°C. Given α=0.004/°C.
    (b) The resistance of a wire of length 100m and of cross sectional diameter 0.1mm is 500Ω. What is its specific resistance? **(2+3)**
30. Two capacitors of capacitance 20μF and 30μF are connected in series across 75V dc supply. Determine (i) Effective capacitance of the combination, (ii) the charge on each capacitor, (iii) the total charge on the combination.
31. Subtract $(1100)_2$ from $(111010)_2$ using 2's complement method.

PART – E

V.Answer FOUR questions. Each question carries FIVE marks. **5X4 = 20**

32. Write a note on scope of electronics.
33. State and explain Thevenin's theorem and explain the procedure to Thevenise a given circuit.
34. (a) Explain the construction of Carbon composition resistor. **(4+1)**
    (b) Draw the symbol of electrolytic capacitor.
35. Classify solids on the basis of energy band diagram.
36. With a circuit diagram, explain the output characteristics of CE mode in a npn transistor.
37. With a circuit diagram, explain the working of two input Diode OR gate and write the truth table also.

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