Tuljaram Chaturchand College of arts science and commerce , Baramati
F.Y.B.Sc (Computer Science)
ELECTRONICS
Circuit Theory and Network Analysis-I
Question Bank(2019-20)

Short Answer (1mark)

1. State the function of resistors in electronic circuits.
2. State the function of capacitors in electronic circuits.
3. Define active and passive components.
4. Define inductance and state its units.
5. Draw the symbol of variable DC voltage source.
6. Define the time constant of the charging circuit.
7. Define impedance and state its units.
8. Give application of cable.
9. Give full forms of BNC, STP&UTP.
10. Define time constant
11. What is filter?
12. State types of filter.
13. State Thevenin's theorem.
14. Draw the circuit symbol of AC voltage source.
15. Draw the circuit symbol of DC voltage source.
16. Define linear and non-linear networks.
17. State maximum power transfer theorem.
18. What are applications of fixed resistor.
19. What is quality factor.
20. What is semiconductor?
21. Define Doping.
22. Write the examples of donor impurities.

23. Write the examples of Acceptor impurities

24. Define resonance.

25. State the unit of capacitance and inductance.

Short Answer (2marks)

1. List different types of passive components

2. What is the ohm's law equation for resistance?

3. Define majority and minority charge.

4. What do you mean by potential barrier in PN junction.

5. Define the term depletion layer.

6. List different types of resistors

7. What is total capacitance when two capacitors are connected in series or connected in parallel?

8. State applications of variable resistor.

9. What are the important specifications of capacitors?

10. Express impedance in polar and rectangular forms.

11. Write expression for series combination of resistances with neat diagram.

12. Write expression for parallel combination of resistances with neat diagram.

13. State kirchhoff's laws.

14. State superposition theorem.

15. State Norton theorem.

16. What do you mean by doping? Which type of semiconductors are fabricated by doping.

17. Draw circuit symbols of Trimmer, potentiometer, rheostat and Trimmer.

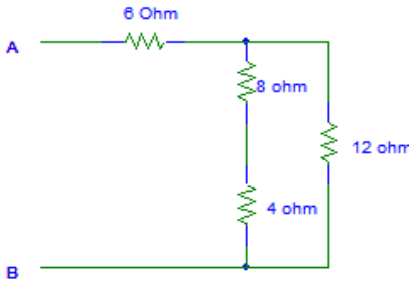
18. A resistor has colour code Orange, Orange, Red and Gold. Identify the value of the resistor.

19. Give the colour code format for i) 510Ω with 20% tolerance

ii) 330Ω with 5% tolerance.

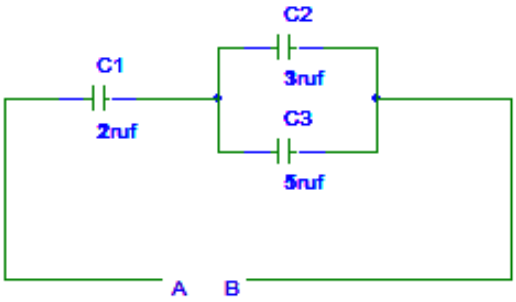
20. Draw symbols of SPDT and DPST.

21. Find equivalent resistance between terminals AB in the following circuit.



22. What is effective value of two capacitors if they are connected in series and in parallel?

23. Find equivalent capacitance of the following circuit.



24. What is transformer? State its types.
25. Explain the terms: Turns ratio and Transformation ratio of transformer.
26. Draw circuit symbols for air, iron & ferrite core inductor.
27. Explain AC and DC signals.
28. Define mesh and node.
29. Define resonant frequency f_r of series resonant circuit and state its expression.
30. What is the value of Z at $f=f_r$.
31. If 10 v potential is applied across 1000 uf capacitor, what is charge stored on it?
32. Define LDR and TDR
33. Enlist various types of variable resistors.
34. Define filter. Enlist various types of filter
35. Define resonance. Write the equation for resonant frequency of LCR circuit.

Long Answer (4 Marks)

1. Explain various types of connectors.

2. Explain the working principle of transformer. Draw circuit symbol for step up and

step down transformer.

3. Write a note on Carbon composition resistor.

4. Write short note on types of cable and their applications.

5. List various types of switches. Explain any two in brief.

6. Determine the value of resistor which are coded

   A) Brown Red Red

   B) Brown Black Orange

   C) Yellow Violet Orange Gold

   D) Brown Black Orange Silver

7. Explain electrolytic capacitor.

8. Define the term: i) Network ii) Branch iii) Mesh iv) Node

9. Describe the various types of resistor in detail.

10. State the use of Switch in circuit. Also draw the symbol of

    A) Rotary B) SPDT C) DPDT D) Push to ON type of switch

11. Explain charging of capacitor through a resistor and define the time constant.

12. Draw the circuit symbol of

    i) constant current source ii)Dual DC voltage Source

    iii) AC voltage source iv) Variable DC Voltage source v)AC current Source.

13. What is capacitor? State different types of capacitors. Explain capacitive reactance.
14. What is inductor? How they are classified according to construction? What is

    inductive reactance of it?

15. Write short note on Co-axial cable.

16. Give at least two applications of i) Inductor ii) fuse iii) switch iv) cable.

17. Draw and explain discharging process of capacitor.

18. What are linear resistors? Explain different types of linear resistors.

19. What are non-linear resistors? Explain different types of non-linear resistors.

20. Describe specifications of resistors.

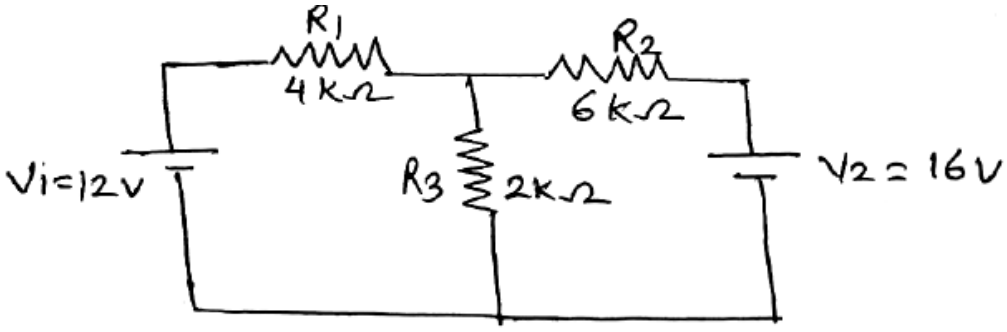
21. Draw the circuit diagram of RC low pass filter and explain typical nature of its frequency response curve.

22. Define the parameters frequency, period, phase rms value for ac signal.

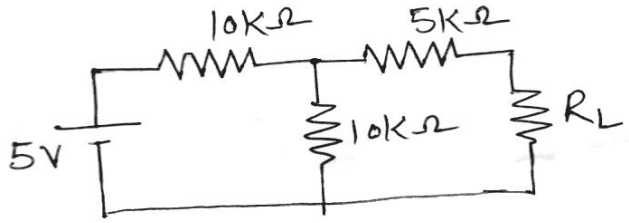
23. State and explain super position theorem.

24. State and prove maximum power transfer theorm.

25. Using superposition theorem find the current through R_3.

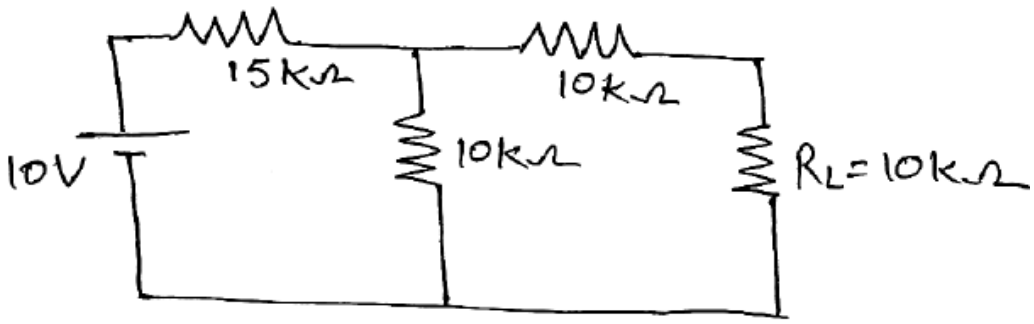


26. Determine Thevenin's equivalent circuit for the following network.

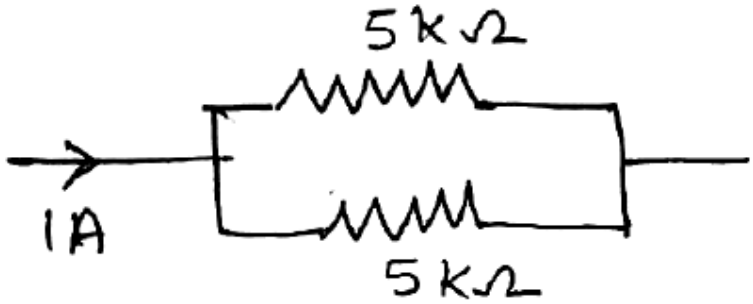


27. Using Thevenin's theorem find the current through R_L

28. Determine Norton's equivalent circuit for the following network.



29. Find the current through each resistor

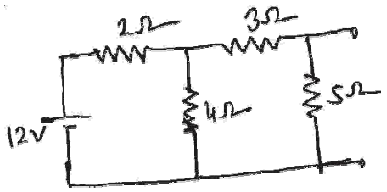


30. Define the following terms. i) Filter ii) Bandwidth iii) Impedance iv) Q factor

Long Answer (6Marks)

1. What is switch? What is function of it? How switches are selected in various applications?
2. Explain working principle of transformer with its application.
3. Describe the charging and discharging action of capacitor.
4. Write a note on connectors.
5. What is inductor? State unit of inductance. Explain series and parallel circuit of inductor.
6. What is filter? Explain working of Low pass filter and its frequency response with neat diagram.
7. Define filter. Explain High pass filter in detail.
8. Define semiconductor. Explain formation and conduction in intrinsic semiconductor.
9. What do you mean by semiconductor. Describe formation and conduction in extrinsic semiconductor

10. What is filter. Enlist the types of filter. Explain band pass and band reject filter.
11. Explain 3 band , 4band, 5band and 6 band colour code systems for resistance values. What is tolerance of resistor? How it is indicated?
12. State Thevenin's Network theorem and determine Thevenin's equivalent circuit for the following network



13. Describe the formation of n type and p type semiconductor.
14. Define resonance. For series RLC resonance circuit derive expression for resonant frequency and explain frequency response.
15. Explain series RLC resonant circuit and derive expression for resonant frequency.

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