MID TERM EXAMINATION OCTOBER -2023

FIRST PUC ELECTRONICS(40)

MAX MARKS: 70

TIME: 3.15Hrs

PART – A

1. Pick the correct answer from the options given below.   15x1=15

2. Who discovered electrons?
   a) J.J.Thomson   b) Shockley   c) J.A.Fleming   d) Jack Kilby

3. Example for power semiconductor device
   a) Zener diode   b) LED   c) SCR   d) BJT

3. The SI unit of Electric charge
   a) Ampere   b) watt   c) Coulomb   d) Joule

4. 1kWh = _____ Joules
   a) 1.6×10^{-19} b) 9.1×10^{-31} c) 3.6×10^{6} d) 6.25×10^{18}

5. The current flowing through a resistance of 10KΩ, when a potential of 20V is applied.
   a) 2mA   b) 2A   c) 0.5mA   d) 2KA

6. The number of AC cycles completed in one second is _____
   a) Frequency   b) time period   c) wave length   d) velocity

7. _____batteries are widely used in mobile phones
   a) Li – ion   b) nickel –zinc   c) nickel-cadmium   d) alkaline

8. Which type of capacitor is sensitive to polarity?
   a) Paper capacitor   b) mica capacitor
   c) SMD capacitor   d) Electrolytic capacitor

9. Write the resistance value of SMD resistor with code 333?   Ans.

10. What is the effect of reverse bias on the width of depletion layer?
    a) Increases   b) decreases   c) remains same   d) none of these

11. Materials which allow the electric charges to flow through them are called as
    a) Insulators   b) semiconductors   c) conductors   d) resistors

12. Name the active component used for rectification is
    a) Resistor   b) capacitor   c) inductor   d) None of these

33. Define the following terms in an AC signal:
    i) Frequency ii) time period iii) Peak value
34. Write the four colour bands for the following resistance values:
    a) 100 KΩ ± 5%
    b) 2.2 KΩ ± 10%
    c) 560 Ω ± 20%
35. Explain the construction of carbon composition resistor.
36. Write any three properties of semiconductor.
37. Explain how depletion region is formed in an unbiased semiconductor.
38. Explain the lattice structure of n-type semiconductors.

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PART – D

(SECTION -1)
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V. Answer any THREE questions   3X5=15

39. Compare AC and DC (any five properties)

40. Derive an expression for effective resistance when two resistors are

    Connected in series.

41. State and explain maximum power transfer theorem.

42. On what factors the capacitance of a capacitor depends? And hence write an

    expression for capacitance and mention the terms.

43. What is doping? Classify conductors and insulators on the basis of energy band
    diagram.

44. With a circuit diagram explain the working of half wave rectifier and draw input
    and output waveforms.

SECTION – 11

VI. Answer any TWO questions   2x5=10

45. Two resistors of resistances 10KΩ each are connected in parallel across a 6V
    battery. Draw the circuit diagram and find the total current flowing and also find
    the branch currents.

13. Majority charge carriers in p-type semiconductors are

    a) Electrons   b) neutros   c) ions   d) holes

14. Number valence electrons in silicon atom is

    a) 2   b) 4   c) 6   d) 0

15. At Absolute Zero Kelvin, semiconductors acts as a _____

    a) Insulator   b) Conductor   c) Resistor   d) inductor

11. Fill in the blanks with choices given in the brackets .   5X1 =5

    (Germanium, volt, silicon, Branch, inverter, Ampere)

16.   The most commonly used semiconductor in device fabrication is_____.

17.   DC to AC converters are known as _____.

18.   Conductive path through which the same current flows is known as _____.

19.   Joule per coulomb is _____.

20.   0.3volt is the barrier potential of _____.

PART- C

ANSWER ANY FIVE QUESTIONS   5X2 = 10

21.   Give any two applications of cell phone.

22.   Write any two properties of electric charges.

23.   State Ohm's law. Write any one limitation of ohm's law.

24.   Draw any two Non – Sinusoidal AC wave forms.

25.   Find the energy stored in a $8\mu F$ capacitor with 4KV across its plates.

26.   What are active components? Give any one example for passive components.

27.   Mention the different types of semiconductors.

28.   Draw the circuit diagram of positive diode clamper with input and output waveforms.

29.   Mention any two applications of a p-n junction diode.

PART-D

ANSWER ANY FIVE QUESTIONS   5X3=15

30. Write a note on defence applications of Electronics.

31.   Write three relations for electric power.

32.   Explain how a voltage source is converted into current source.

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46. Find the current flowing through 20Ω resistor using Super Position Theorem.
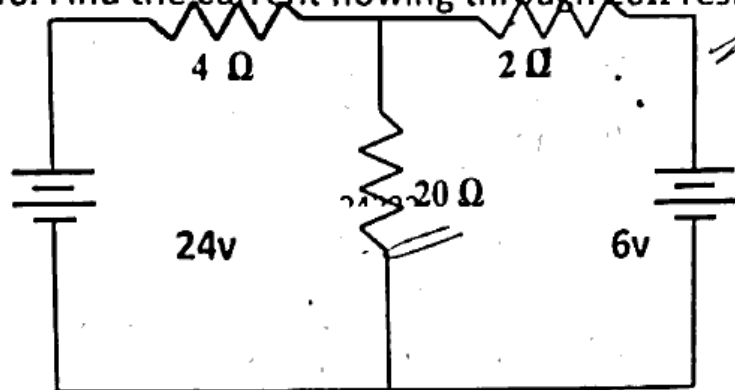
47. Two capacitors of capacitances $20\mu F$ and $30\mu F$ are connected in series across 100 Volt supply. Find a) the equivalent capacitance b) the charge on each capacitor c) potential difference across each capacitor.

48. A half wave rectifier uses a diode with a forward resistance of 50Ω . If the input AC voltage is 200 V rms and the load resistance is of 1KΩ. Determine the following:

i) I_m ii) I_{dc} iii) I_{rms} iv) P_{dc} V) P_{ac}

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