17215

*Instructions –* (1) All Questions are *Compulsory*.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicates full marks.

(4) Assume suitable data, if necessary.

Marks

1. **Attempt any TEN of the following :** **20**

a) State the Faraday's law of Electromagnetic induction along with formula.

b) Draw a label diagram of ferrite core inductor.

c) State the specifications of capacitor.

d) Draw the circuit diagram of bridge rectifier and label it.

e) List the types of filters.

f) Draw the ideal and practical voltage source.

g) State the Kirchoff's voltage law.

h) Calculate the current through 10 Ω resister –
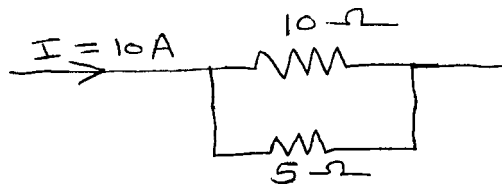
Fig. No. 1

P.T.O.

   i) Draw the symbol of schottky diode and tunnel diode.

   j) State four application of PIN diode.

   k) Draw RC integrator and differentiator.

   l) Draw the circuit diagram of clipper.

2.   **Attempt any <u>FOUR</u> of the following :**   **16**

   a) Explain the working of TDR along with its symbol and characteristics.

   b) List the specifications of linear and nonlinear potentiometers. State its applications (Four points)

   c) Draw the constructional diagram of electrolytic capacitor. Explain the working.

   d) List the classification of capacitor. Which type of dielectric materials used in capacitor.

   e) Draw the construction diagram of air core inductor. List two applications.

   f) Draw the V-I characteristics of P-N junction diode.

      What is static and dynamic resistance of it ?

3.   **Attempt any <u>FOUR</u> of the following :**   **16**

   a) Explain with neat sketch construction of PIN diode. Draw its characteristics in reverse bias mode.

   b) Describe the working of tunnel diode. Draw its characteristics.

   c) Describe the working principle of laser diode.

   d) Explain the working of schottky diode.

   e) Compare L, C, LC and π filter on the basis of – usefullness in reducing ripple or suitability for heavy / light load.

Marks

    f)   State the values of following parameters with reference to full wave rectifier.

        (i)   Ripple factor

        (ii)   Efficiency

        (iii) TUF

        (iv) PIV

4.   **Attempt any <u>FOUR</u> of the following :**   **16**

    a)   Draw the circuit diagram of full wave rectifier with filter. State any four advantages.

    b)   Using colour code, write the colour codes for the following resistors –

        (i)   680 K Ω, $\pm$ 5%

        (ii)   3.3 Ω, $\pm$ 10%

    c)   State the advantages of L and C. filter. (Four points)

    d)   An AC supply of 230V is applied to HWR through a transformer with turns ratio 10 : 1. Find DC outup voltage and PIV of diode.

    e)   Compare PN junction diode and zener diode. (Four points)

    f)   Compare zener breakdown and avalanche breakdown. (Four points)

**5.**   **Attempt any FOUR of the following :**   **16**

a) What is linear and nonlinear waveshaping circuit ?

b) Draw the circuit diagram of negative clamper.

Write one application of negative and positive clamper.

c) Explain the following terms –

(i)   Bilateral Network

(ii)   Linear Network

d) Draw the output waveforms of RC Integrator for square wave and triangular wave as input signal.

e) State the superposition theorem.

f) Draw the star and delta connection. State any one conversion formula.

g) Explain the working principle of slug tuned inductor.

6.   **Attempt any FOUR of the following :**   **16**

a) Draw the output waveform, when a sinewave is applied to following circuits –

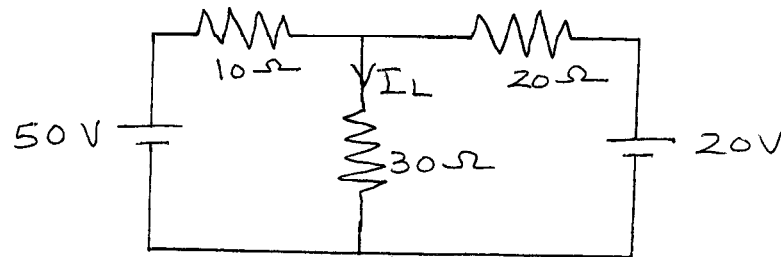(i)   (ii)
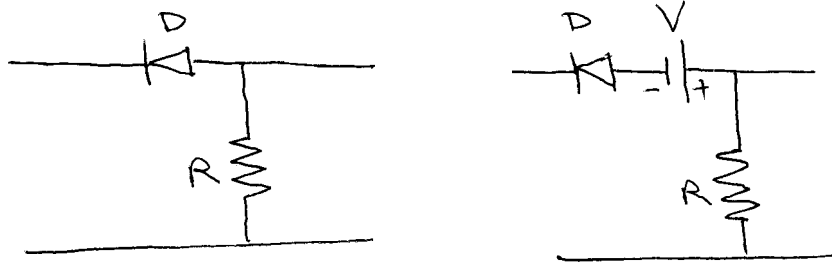
Fig. No. 2

b) Compare clipper and clamper.

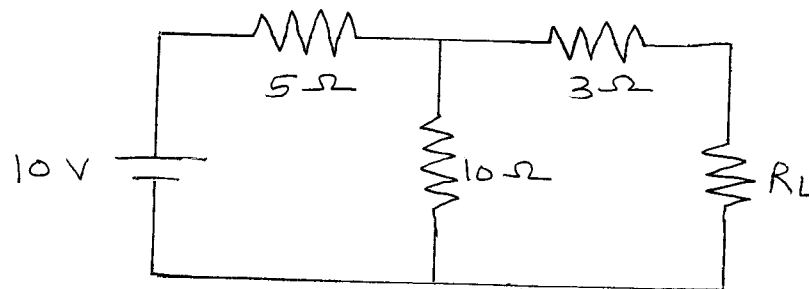c) Define following terms –

(i)   Active networks

(ii)   Unilateral networks

d) Calculate I_L for the network shown in Figure No.3.

Fig. No. 3

e) Find the value of load resistance R_L to get maximum power transferred to it. Refer Figure No.4.

Fig. No. 4

f) State Norton's theorem with suitable example.

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