17215

21415

3 Hours / 100 Marks **Seat No.** | | | | | | | | |

Instructions : (1) All Questions are *compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.

Marks

1. Attempt any TEN : **20**

(a) Define Ferromagnetic materials. Draw B-H curve.

(b) State two functions of slug-tunned inductor and write the expression of self inductance.

(c) State the classification of capacitors.

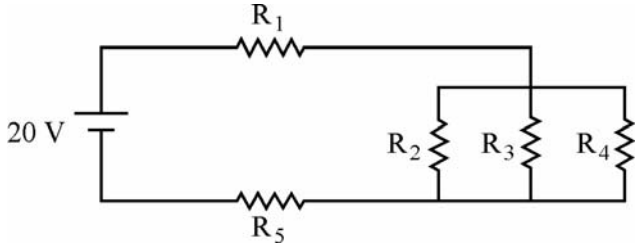
(d) State the need of rectifiers and filter.

(e) Draw the circuit diagram of bridge rectifier and draw its output waveform.

(f) Draw the ideal current source and practical current source.

(g) State Kirchoff's Law (KCL, KVL)

(h) Find the current flowing through R_1 in following circuit :



$R_1 = 100\ \Omega$, $R_2 = 500\ \Omega$, $R_3 = 750\ \Omega$, $R_4 = 1000\ \Omega$, $R_5 = 50\ \Omega$

(i) Write two applications of P-N junction diode and zener diode.

(j) Draw the symbol of
(1) Zener diode
(2) Schottky diode
(3) LED
(4) Tunnel diode

(k) What is the meaning of linear and non-linear wave-shaping circuit ?

(l) Draw RC integrator and differentiator.

P.T.O.

2. Attempt any FOUR : **16**

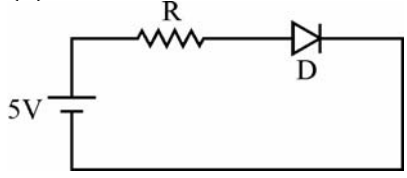
(a) Describe the working of LDR with neat sketch and list applications of it.
(b) Compare linear and logarithmic potentiometers. (any four points)
(c) Draw the construction diagram of electrolytic capacitor and write the materials used for different parts.
(d) Write four specifications of capacitor. Write the range of values for any one type of capacitor.
(e) Draw the construction diagram of iron core inductor and write the working of it.
(f) Draw and describe the P-N junction diode characteristics.

3. Attempt any FOUR : **16**

(a) List four specifications of zener diode or P-N junction diode.
(b) Draw the characteristics of tunnel diode and write two applications of it.
(c) Explain the working principle of Schottky diode with neat sketch.
(d) Describe the operating principle of LASER diode with diagram.
(e) Draw the circuit diagram of shunt capacitor filter along with full wave rectifier. Draw the waveform of full wave rectifier output and shunt capacitor filter output.
(f) Write the function of C and L in π filter and write two advantages of π filter over other filters.

4. Attempt any FOUR : **16**

(a) Define :
  (1) PIV
  (2) TUF
  (3) Ripple factor
  (4) Efficiency of rectifier
(b) Explain the colour coding using colour-band system in capacitor with an example.
(c) The input AC power to HW rectifier is 140 W and DC power output is 60 W. Calculate the efficiency of rectification.
(d) Compare HW and FW (CT type) rectifier on the basis of :
  (1) PIV
  (2) Efficiency
  (3) Ripple Frequency
  (4) Necessity of transformer
(e) Compare P-N junction diode with zener diode.
(f) Calculate the value R in the following circuit to get maximum forward current of 100 mA
  (1) when diode is Si-diode
  (2) when diode is Ge-diode

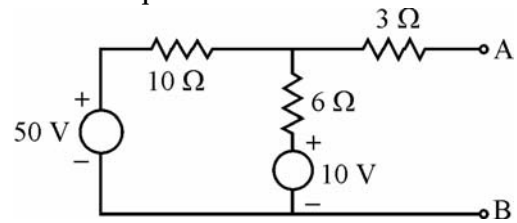


5. Attempt any FOUR : **16**

(a) Draw the positive clamper circuit and explain its working.

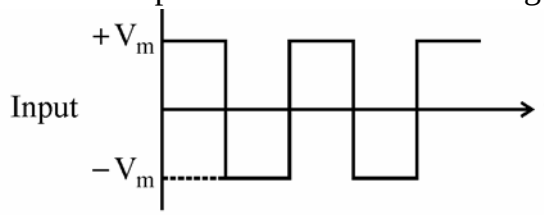
(b) Draw the clipper circuit using series and shunt diode

(c) Find the Thevenin's equivalent circuit for the circuit shown in fig.

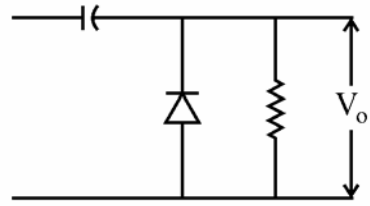


(d) Compare RC integrator and differentiator.

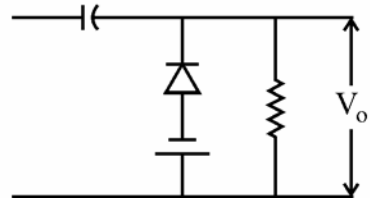
(e) Draw the output waveform for following circuits when input is



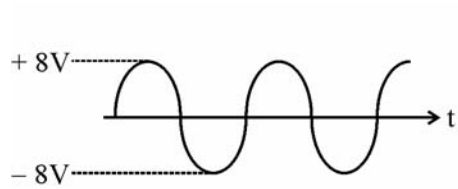
Circuits (1)

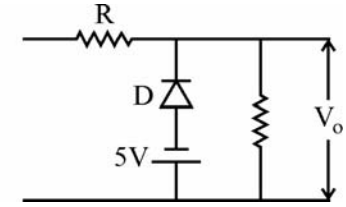


(2)



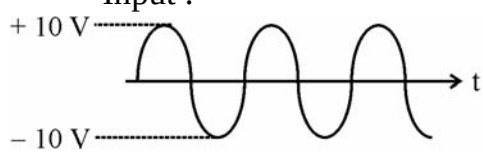
(f) (i) Draw the output waveform for following circuit :

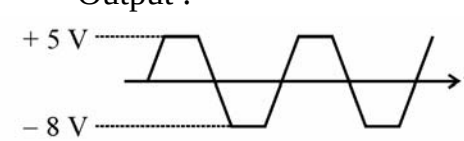




(ii) Draw the circuit for following input and output :

Input : Output :





6. Attempt any FOUR : **16**

(a) Compare clipper and clamper.

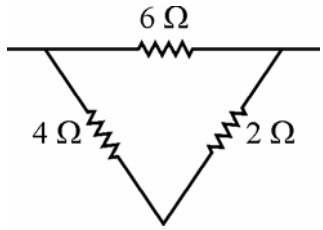
(b) State the condition for RC differentiator. Draw the output waveform of RC integrator for square wave input.

(c) Compare :

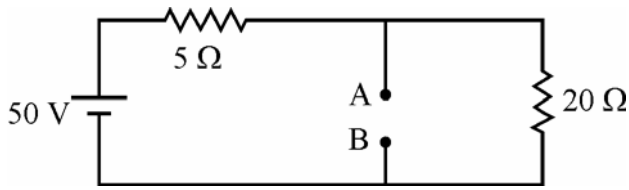
(1) Active network and passive network.

(2) Linear network and non-linear network.

(d) Convert the delta network into equivalent star network.

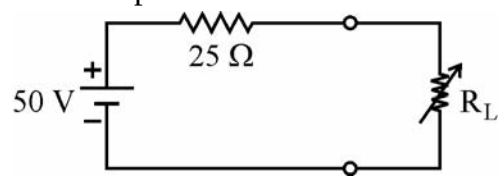


(e) Find the Norton's current through AB



(f) (1) State the maximum power transfer theorem.

(2) For the circuit shown in fig, determine the value of load resistance when load resistance draws maximum power. Also find the value of the maximum power.



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