17215

21314

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** of the following : **20**
   a) Draw symbols of Schottkey diode and Tunnel diode.
   b) Define permeability and reluctivity of magnetic material.
   c) State different types of filters.
   d) List two applications of LDR.
   e) Define Rectifier. List its types.
   f) List any two applications of photodiode and IRLED.
   g) State the necessity of waveshaping circuits.
   h) State Kirchoffs current law along with its formula.
   i) List any four applications of Laser diode.
   j) Draw ideal current source and practical current source.
   k) Define rectification efficiency. Give its formula.
   l) Draw circuit diagram of RC differentiator. Write expression for output.
   m) List any four dielectric materials used in manufacturing the capacitor.
   n) State superposition theorem.

2. Attempt **any four** of the following : **16**
   a) Describe NTC and PTC resistors with temperature resistance characteristics.
   b) Describe the working of PN junction diode with neat sketch under forward biased condition.
   c) Draw the constructional diagram of iron core inductor. List applications.
   d) Describe construction of Aluminium Electrolytic capacitor.
   e) Draw the circuit diagram for centre tap full wave rectifier with LC filter. Draw its input and output waveforms.
   f) Describe the working of positive clamper with neat circuit diagram and input/output waveforms.

MARKS

3. Attempt **any four** of the following : **16**

a) Write color codes for following resistors.

i) 470 kΩ ± 5% ii) 1.2 MΩ ± 10%.

b) Define following terms in case of PN junction diode :

i) Static resistance ii) Dynamic resistance

iii) Cut-in voltage iv) Breakdown voltage.

c) Draw construction of PVC gang capacitor and describe its working.

d) Compare HWR and FWR (any four points).

e) Draw construction of Tunnel diode. Describe its working.

f) Identify the following circuit. Draw its input/output waveforms. (Refer Figure 1)

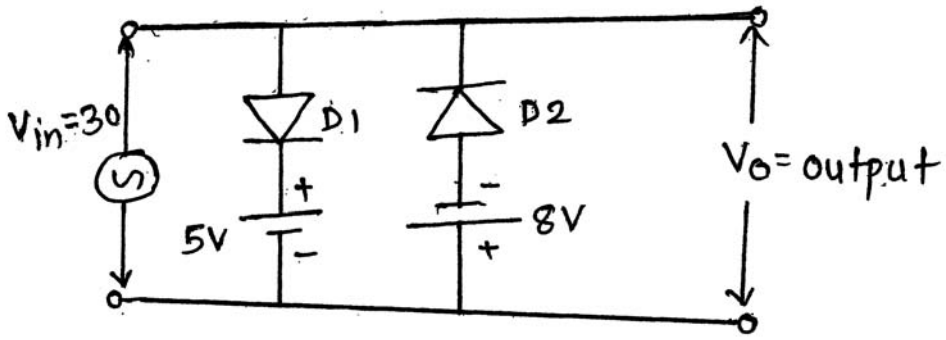

Figure : 1 [Q. 3 (f)]

4. Attempt **any four** of the following : **16**

a) Draw VI characteristics of zener diode. List its two specifications.

b) Draw construction of LED and explain its working.

c) Draw circuit diagram for RC integrator. Write expression for output voltage. Draw output waveform for square wave as input.

d) In full wave bridge rectifier load resistance $R_L = 2\ k\Omega$. The diode has forward bias dynamic resistance of $10\ \Omega$. If AC voltage across secondary winding of transformer is V = 100 sin 314t. Determine

i) Peak value of current (I_m) ii) DC value of voltage (V_{dc})

iii) DC value of current (I_{dc}) iv) PIV.

MARKS

e) Compare soft magnetic materials and hard magnetic materials. (For four points.)

f) Calculate equivalent resistance R_{AB} using delta-star transformation (Refer Figure : 2)

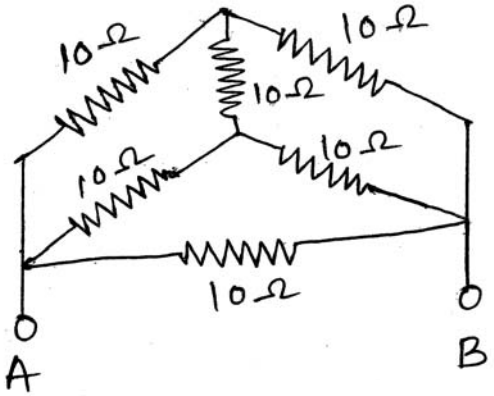

Figure : 2 [Q. 4(f)]

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

a) Describe the meaning of the term open circuit and short circuit with neat diagram.

b) Compare LED and PN junction diode (any four points).

c) Define following terms in case of rectifier

i) Ripple factor ii) TUF

iii) Ripple frequency iv) PIV.

d) Compare clipper and clampers by any four points.

e) State and explain Thevenien's theorem with suitable example.

f) Calculate the value of current in 5Ω resistor. Using Norton's theorem for a network as shown. (Refer figure : 3)

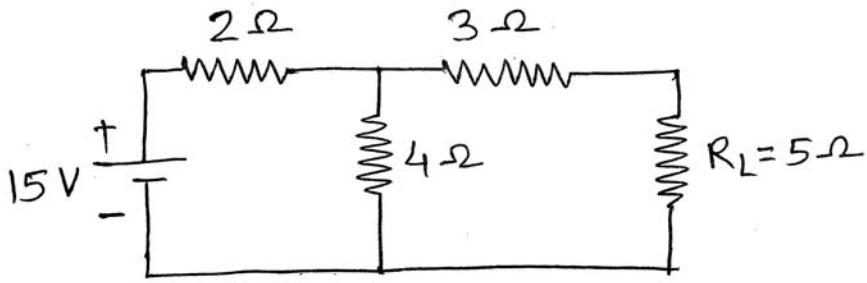

Figure : 3 [Q. 5(f)]

MARKS

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

a) Define following terms :

i) Active network ii) Passive network

iii) Linear network iv) Non-linear network

b) Describe avalanche and zener breakdown of PN junction.

c) Draw the circuit diagram of bridge rectifier with π Filter. Describe its working. Draw input/output waveforms.

d) With the help of circuit diagram, input/output waveforms describe operation of negative shunt clipper.

e) Calculate current flowing through 6Ω resistor using KVL. (Refer Figure : 4)

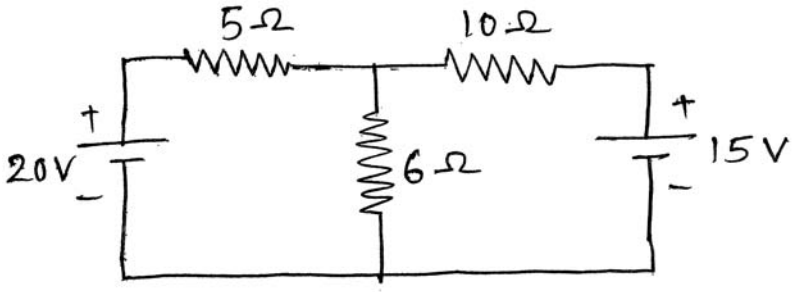

Figure : 4 [Q. 6(e)]

f) Calculate value of R_L, so that power transferred is maximum in the circuit shown in figure. (Refer Figure : 5)

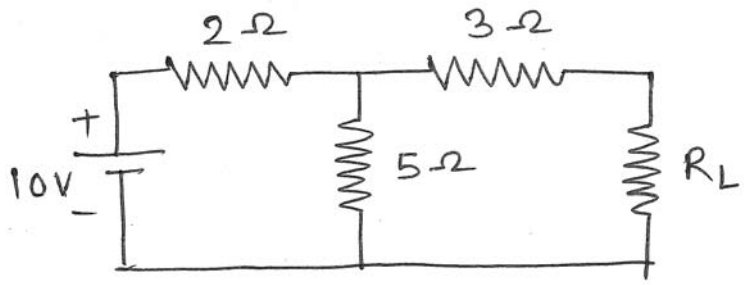

Figure : 5 [Q. 6(f)]