17215

21718

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.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any TEN : **20**

(a) Write colour code of 1 kΩ resistor.

(b) Draw the symbol of (i) zener diode, (ii) Schottky diode, (iii) LED, (iv) Tunnel diode.

(c) List the two advantages of Bridge Rectifier.

(d) List any four applications of laser diode.

(e) State different types of filters.

(f) Define clipper. Draw circuit of negative shunt clipper.

(g) Define linear and non-linear wave-shaping circuit.

(h) Draw an ideal current source and practical current source.

(i) List any two applications of Schottkey diode.

(j) Define self-inductance and mutual inductance.

(k) State the necessity of wave-shaping circuit.

(l) State Kirchoff's current law along with its formulae.

(m) State superposition theorem.

(n) List any two applications of photo diode and IRLED (each).

2. Attempt any FOUR : **4 × 4 = 16**

(a) Draw circuit diagram and waveforms for centre-tap full wave rectifier.

(b) Describe working of negative clamper circuit with neat diagram and waveform.

(c) Describe the operating principle of LASER diode with diagram.

(d) By using Maxwell's loop current method, calculate current in 4 W resistance for the network shown in figure no. 1.

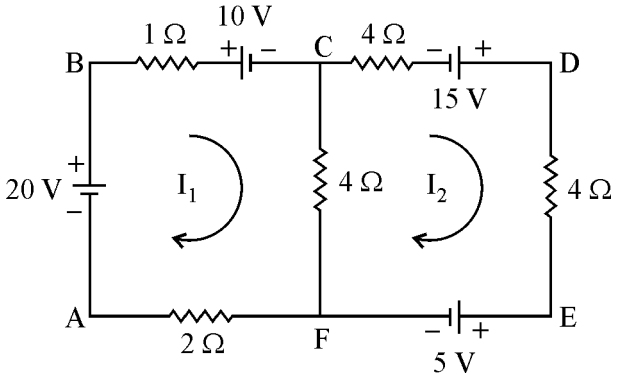

Fig. 1

(e) Draw and explain B-H curve.

(f) Define static and dynamic resistance of diode.

3. Attempt any FOUR : **4 × 4 = 16**

(a) With the help of circuit diagram and waveforms, explain working of RC differentiator.

(b) State the advantages of L and C filter. (four points)

(c) Describe avalanche and zener breakdown of PN junction with neat graph.

(d) Calculate current flowing through 6 Ω resistor using KVL (refer fig. 2)

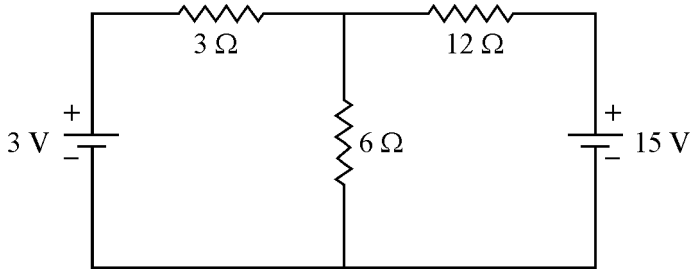

Fig. 2

(e) Draw and describe construction of LED.

(f) Define given parameters and state their values for bridge rectifier (i) Ripple factor (ii) PIV of diode.

4. Attempt any FOUR : **4 × 4 = 16**

(a) Write down the colour code for following resistor :

(i) 150 Ω ± 5% (ii) 3.3 kΩ ± 20%

(b) Describe working of variable air gang capacitor with neat sketch.

(c) Describe the working of PN junction diode with neat sketch under forward biased condition.

(d) Compare soft magnetic materials and hard magnetic materials. (four points)

(e) In bridge rectifier load resistance R_L = 2 kW. The diode has forward dynamic resistance of 10 W. The AC voltage across the secondary winding of transformer is V = 50 sin 413 tV. Determine : (i) Peak current (ii) DC value of current (iii) PIV of diode (iv) DC voltage

(f) Using Thevenin's theorem find load current I_L (refer figure 3)

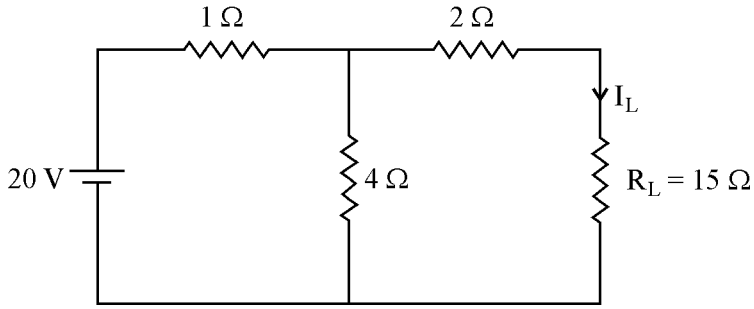

Fig. 3

5. Attempt any FOUR : **4 × 4 = 16**

(a) With help of circuit diagram & waveform, explain working of CLC or π filter.

(b) Identify the following circuit. Draw its input / output waveforms. (refer figure 4)

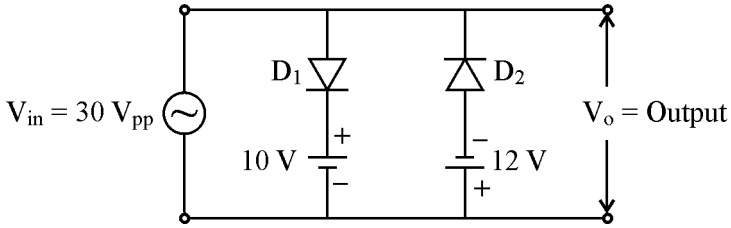

Fig. 4

(c) Compare HWR and FWR. (four points)

(d) State Maximum Power Transfer Theorem.

P.T.O.

(e) Calculate the value of current in 10 Ω resistor using Norton's Theorem. (refer fig. 5)

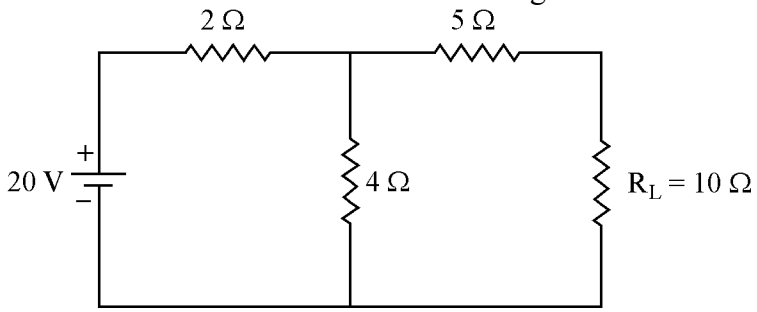

Fig. 5

(f) Compare linear and logarithmic potentiometer.

6. Attempt any FOUR : **4 × 4 = 16**

(a) Calculate value of capacitor if following is printed on body of capacitors : (i) 404 (ii) 2K3.

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

(c) With the help of constructional diagram, explain the working of LDR with neat sketch.

(d) Explain with neat circuit, concept of open circuit and short circuit.

(e) Calculate equivalent resistance, RAB between terminals A & B using delta – star transformation. (refer fig. 6)

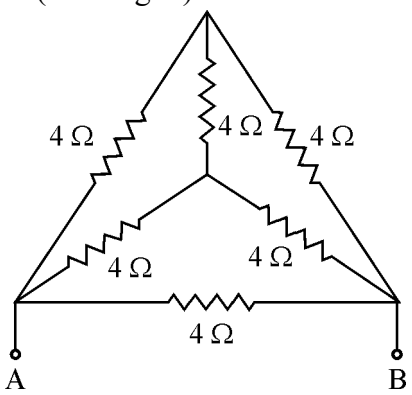

Fig. 6

(f) Find current through resistance R_4 using super-position theorem. (refer fig. 7)

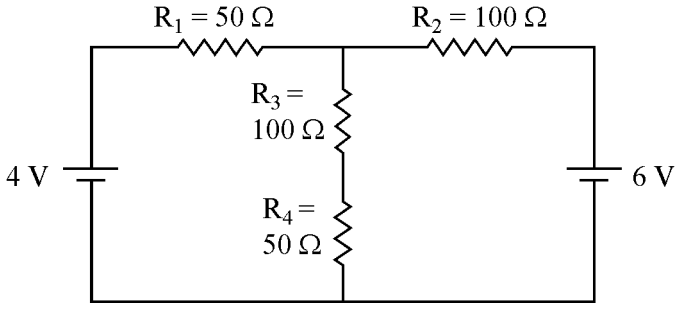

Fig. 7