

17215

21819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Solve any TEN :

10 × 2 = 20

- (a) Define resistor. Draw the symbols for fixed & variable resistors.
- (b) List the types of non-linear resistors.
- (c) Classify inductor.
- (d) Draw symbol of P-N junction diode. State the meaning of forward biasing and reverse biasing of P-N junction diode.
- (e) State the value of cut-in-voltage of PN junction diode for Silicon & Germanium.
- (f) Define rectifier and list the types of rectifier.
- (g) Draw the circuit diagram of full wave bridge rectifier.
- (h) Give the classification of wave shaping circuit.
- (i) Draw the circuit diagram of RC integrator.
- (j) State the value of voltage across a short circuit & current flowing through an open circuit.

- (k) Calculate the value of current flowing through $10\ \Omega$ resistor for following fig. 1 (a).

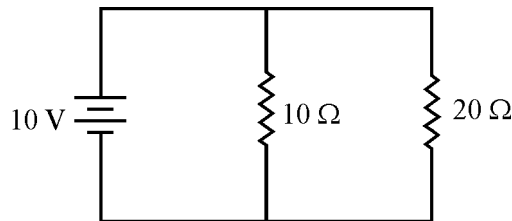


Fig.1 (a)

- (l) State the superposition theorem.

2. Attempt any FOUR of the following :

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- (a) Depending on the materials used, which are the types of resistor ? Draw the construction of a carbon composition resistor.
- (b) (a) Give colour code for following resistance value :
- (i) $10\ \text{k}\Omega \pm 10\%$ (ii) $4.7\ \text{k}\Omega \pm 5\%$
- (b) Give the values for following colour codes :
- (i) Yellow, Violet, Orange, Gold.
- (ii) Brown, Red, Red, Silver.
- (c) State the meaning of linear potentiometer and state its two applications.
- (d) Draw and describe the construction of PVC gang capacitor.
- (e) Compare PN junction diode and Zener diode. (any 4 points).
- (f) Define : (i) TUF, (ii) Ripple factor, (iii) PIV, (iv) Rectification efficiency. With respect to rectifier.

3. Attempt any FOUR of the following :

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- (a) Draw the circuit diagram and V-I characteristic of Reverse biased P-N junction diode.
- (b) Draw the symbols of following diodes :
- (i) Schottky diode (ii) Tunnel diode
- (iii) LED (iv) Photodiode
- (c) Compare PN junction diode and LED w.r.to (i) Symbol, (ii) Material used, (iii) Ability to emit light, (iv) Applications.
- (d) Draw construction of photodiode and describe its operation.
- (e) Calculate the value of following capacitors :
- (i) 103 (ii) 225
- (iii) Orange, Orange, Blue (iv) Yellow, Violet, Yellow
- (f) Compare RC integrator & RC differentiator (any 4 points).

4. Attempt any FOUR of the following :

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- An AC supply of 220 V is applied to half wave rectifier circuit. Transformer turns ratio is 10:1. Find D.C. O/P voltage and PIV of the diode.
- Compare HWR and Bridge rectifier (any four points).
- Draw circuit diagram of FWR (Bridge) with π filter and explain its working with waveforms.
- Draw a labelled hysteresis loop showing residual magnetism and coercive force in it.
- Draw V-I characteristic of tunnel diode. Also list two applications of tunnel diode.
- State KCL & write the steps to find current through any branch using KCL.

5. Attempt any FOUR of the following :

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- Draw the circuit of series negative clipper. Also draw its I/P & O/P waveforms.
- Identify the circuit and discuss the working of the same. Also draw its i/p & o/p waveforms. (Fig. b)

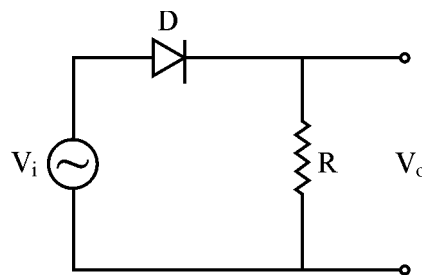


Fig. (b)

- Describe positive clamper with neat circuit diagram. Also explain the working of it with waveform.
- Draw the circuit of FWR with series inductor filter. (centre tapped)
- Draw the following :
 - Ideal voltage source
 - Practical current source
 - Practical voltage source
 - Ideal current source
- State formulae for conversion from delta to star & star to delta connection with diagrams of star & delta connections.

P.T.O.

6. Attempt any FOUR of the following :

- (a) Using Norton's theorem, find the current flowing through load resistance R_L Fig. (c)

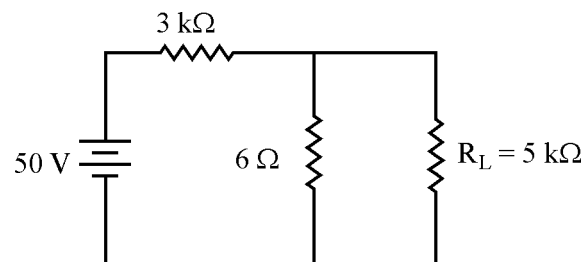


Fig. (c)

- (b) Write the steps to find current flowing through R_3 in the following fig. using superposition theorem. (Fig. (d))

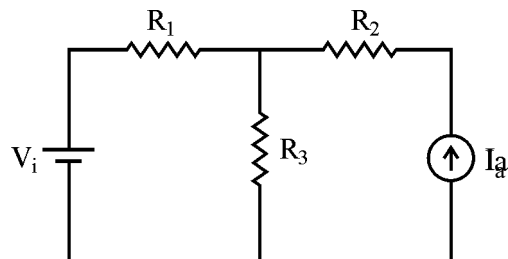


Fig. (d)

- (c) Find the current in the 5Ω resistance for the circuit shown in the following fig. using loop current analysis. (Fig. (e))

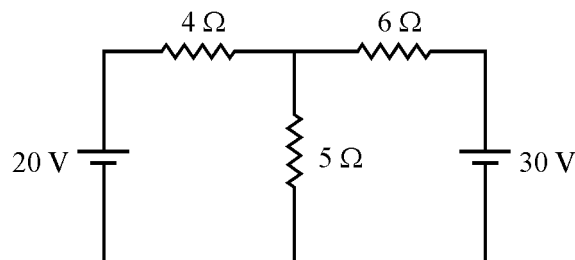


Fig. (e)

- (d) State maximum power transfer theorem. State the condition for the transfer of maximum power from the source to the load.
- (e) Draw construction of Schottky diode and also give two applications of Schottky diode.
- (f) List any two applications of clipper and two applications of clamper circuit.
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