

# 17215

**13141**

**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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
  - (8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

**Marks**

1. **Attempt any TEN of the following:** **20**
  - a) Define self inductance and mutual inductance.
  - b) Draw the neat sketch of Toriodal inductor state it's one advantage and disadvantage.
  - c) Define rectifier and state its types.
  - d) Write colour code for 0.68  $\mu\text{f}$  capacitor
  - e) State different types of filters used in rectifiers.
  - f) Draw the symbol ideal current and voltage source.

P.T.O.

- g) State the Kirchoff's current law with suitable example.
- h) State superposition theorem.
- i) Draw symbol of photodiode, LED, tunnel diode and schottky diode.
- j) Draw constructional diagram of schottky diode with suitable label.
- k) State the necessity of waveshaping circuit.
- l) Draw neat circuit diagram of RC integrator. Draw nature of O/P signal for sinewave input.

2. **Attempt any FOUR of the following:**

**16**

- a) Explain PTC and NTC resistors with temperature-resistance characteristics.
- b) Compare linear and logarithmic potentiometer (any four points)
- c) State the functions of the following essential parts in an electrolytic capacitor.
  - i) Aluminium foil
  - ii) oxide film
  - iii) Spacers
  - iv) Aluminium container
- d) Draw the circuit diagram of full wave centertapped rectifier with LC filter. Explain with I/P and O/P waveform.
- e) Draw an experimental set up for V-I characteristics of P-N junction diode.
- f) Explain working of RC differentiator circuit. Draw its input and O/P waveforms.

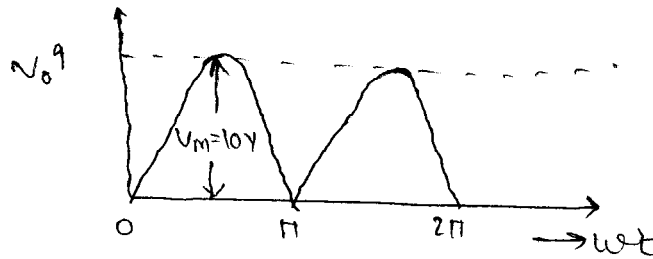
**3. Attempt any FOUR of the following:****16**

- a) Compare Avalanche and Zener breakdown.
- b) Explain airganged capacitor with its constructional diagram.
- c) Describe the operating principle of LED with constructional diagram.
- d) Explain the following terms
  - i) Active network
  - ii) Linear network
  - iii) Bilateral network
  - iv) Unilateral network
- e) Compare half wave and center tapped full wave rectifier with respect to
  - i) No. of diodes
  - ii) PIV
  - iii) Efficiency
  - iv) Nature of output waveform.
- f) State the values of following parameters with reference to half wave rectifier.
  - i) Ripple factor
  - ii) Ripple frequency
  - iii) TUF
  - iv) Efficiency

4. Attempt any **FOUR** of the following:

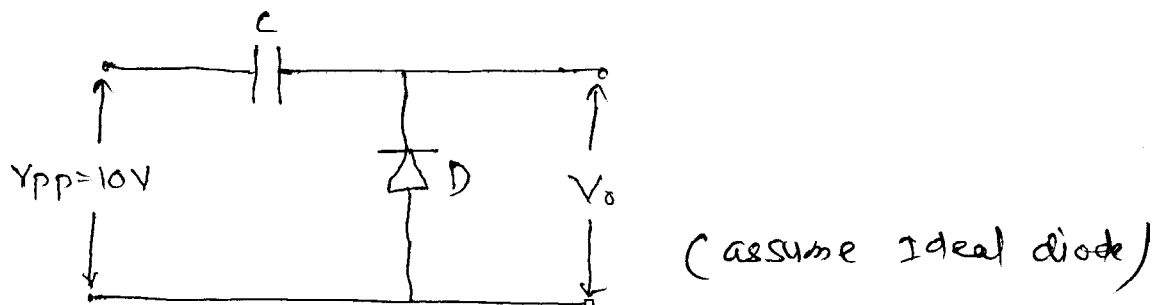
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- Explain circuit operation of  $\pi$ (pi) filter also draw its Input and O/P waveforms.
- Describe the working of PN junction diode with neat sketch under forward biased condition.
- Draw and explain B-H curve.
- State Norton's theorem with suitable example.
- Draw circuit diagrams and Input-Output waveforms for positive and negative clamping circuits.
- In FWR,  $V_M = 10V$ ,  $R_L = 10k\Omega$ , calculate  $V_{DC}$ ,  $I_{DC}$  Refer Figure No. 1.

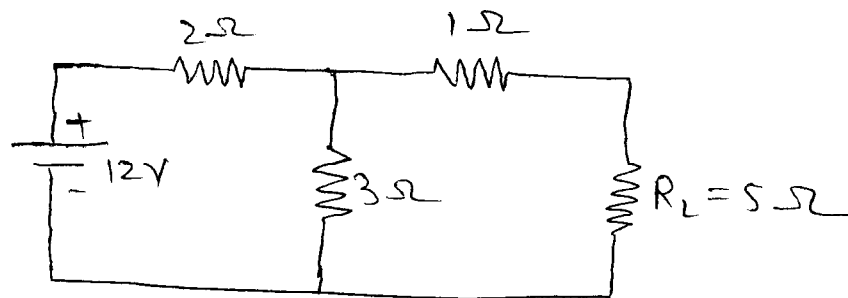
**Fig. No. 1**5. Attempt any **FOUR** of the following:

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- Explain operation of combinational clipper with neat ckt diagram and Input-Output waveforms.
- Identify the following circuit shown in Figure No.2 draw Input and Output waveforms.

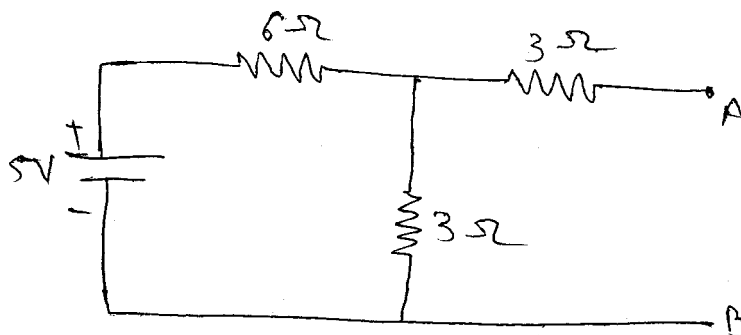
**Fig. No. 2**

- c) Describe the operating principle of Laser diode with neat sketch.
- d) Describe the operating principle of PIN diode with neat sketch.
- e) Calculate the value of current in  $5\Omega$  resistance using Norton's theorem for the network shown in Figure No.3.



**Fig. No. 3**

- f) Obtain the Thevenin's equivalent circuit for the network shown in Figure No.4

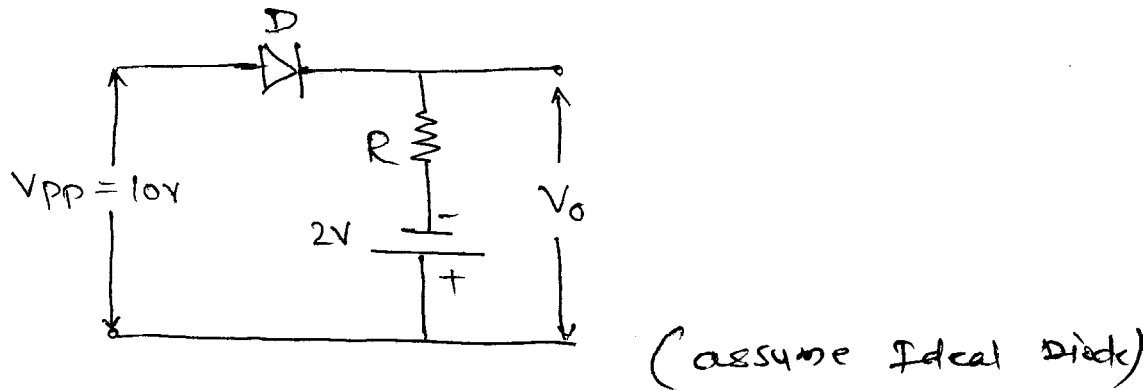


**Fig. No. 4**

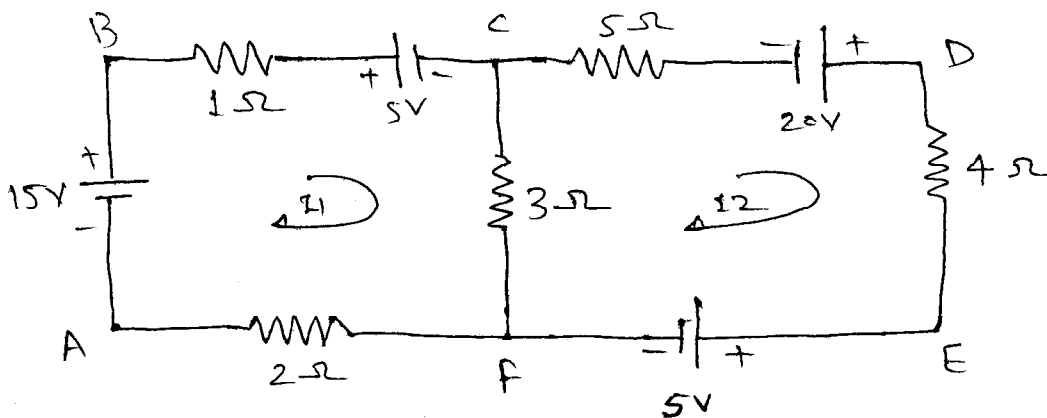
6. Attempt any **FOUR** of the following:

16

- a) Identify the circuit and draw I/P and O/P waveform shown in Figure No. 5.

**Fig. No. 5**

- b) Calculate the value of following resistors using colour code.
- orange, blue, red, golden
  - yellow, violet, orange
  - Brown, black, black, red
  - Brown, Black, Black Brown, Brown.
- c) Draw and explain reverse biased V-I characteristics of Zener diode.
- d) State the material used for manufacturing following colour LED's Infrared, yellow, green, red. State the application of LED.
- e) Three resistances each of  $12\Omega$  are connected in star. Convert it into equivalent delta connection.
- f) By using Maxwells loop current method. Calculate current in  $3\Omega$  resistance for the network shown in Figure No. 6.

**Fig. No. 6**

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