

17215

15116

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. **Attempt any TEN of the following:** **20**
- State the classification of capacitors.
 - State the Faraday's laws of electromagnetic induction.
 - List the types of filters.
 - Draw the ideal and practical voltage source.
 - State Kirchhoff's current law and voltage law (KCL and KVL).
 - Write two applications of P-N junction diode and zener diode.
 - Define self inductance and mutual inductance.
 - Write colour code of 1 k Ω resistor.
 - Define Q factor.
 - Draw the symbol of Schottky diode, Tunnel diode, PIN diode, Zener diode.
 - Draw the circuit diagram of bridge rectifier and show its output waveform.

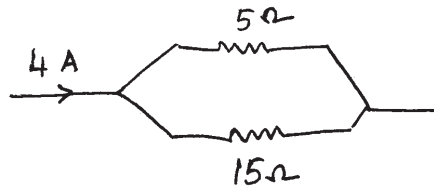
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Marks

- l) Calculate the current through 5Ω resistor shown in Fig. No. 1

**Fig. No. 1**

- m) Give the need of rectifier.
n) State the parameter of rectifier.

2. Attempt any FOUR of the following: 16

- Draw the constructional diagram of electrolytic capacitor and explain the working.
- Write the specifications of linear and non-linear potentiometers. State its applications (four points).
- Draw the characteristics of tunnel diode and write two applications of it.
- Describe the operating principle of LASER diode with constructional diagram.
- List specifications of resistors and explain any two.
- Explain the working of RC differentiator.

3. Attempt any FOUR of the following: 16

- Compare Avalanche and Zener breakdown.
- Explain air gang capacitor with its constructional diagram.
- Compare half wave and centre tapped full wave rectifier with respect to:
 - No. of diodes
 - PIV
 - Efficiency
 - Nature of output waveform.
- Explain the working of Schottky diode.
- Explain the V-I characteristics of zener diode.
- Draw and describe the working principle of IRLED.

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Marks

4. Attempt any FOUR of the following:

16

- State the advantages of L and C filter.
- Using colour code, write the colour codes for the following resistors:
 - $680 \text{ k}\Omega \pm 5\%$
 - $3.3 \Omega \pm 10\%$
- Draw and explain B-H curve.
- State Norton's theorem with suitable example.
- Draw circuit diagrams and input-output waveforms for positive and negative clipping circuits.
- In FWR, $V_m = 10 \text{ V}$, $R_L = 10 \text{ k}\Omega$, calculate V_{dc} , I_{dc} ,
Refer Fig. No. 2

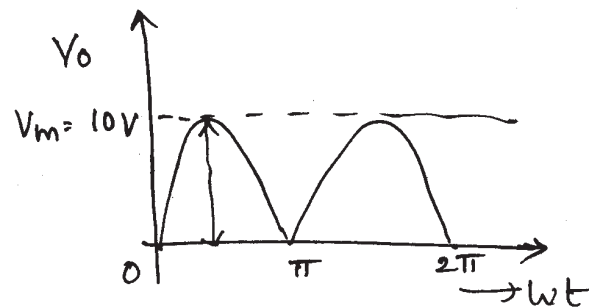


Fig. No. 2

5. Attempt any FOUR of the following:

16

- Draw and explain the working of positive clamper circuit.
- State the condition for RC integration. Draw the output waveform for square wave input.
- Identify the following circuit shown in Fig. No. 3 and draw input and output waveforms.

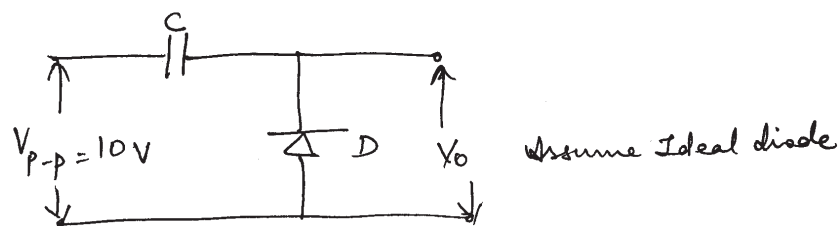


Fig. No. 3

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- d) Describe the operating principle of PIN diode with neat sketch.
 e) Define Bilateral and Linear network.
 f) State Norton's theorem and draw the equivalent circuit.

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

16

- a) Three resistances each of 12Ω are connected in star. Convert it into equivalent delta connections.
 b) State the working principle of LED and LASER diode.
 c) For the circuit shown in Fig. No. 4, determine the value of R_L when maximum power is drawn. Also find the value of value of maximum power.

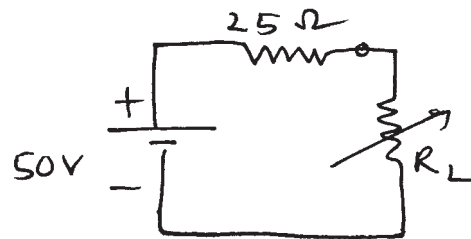


Fig. No. 4

- d) Draw and explain V-I characteristics of P-N junction diode.
 e) Compare clipper and clamper (four points).
 f) Determine current I_L for network shown in Fig. No. 5 using Thevenin's theorem.

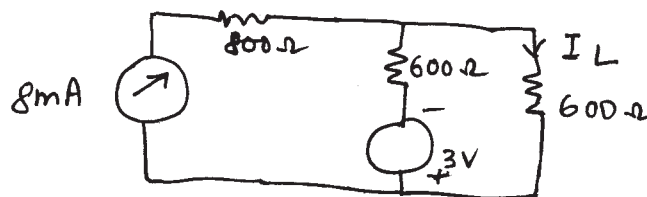


Fig. No. 5