

17213

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) 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.

Marks

- 1. Attempt any TEN of the following: **20****
- a) Define active components. Give one example.
- b) Draw symbols of npn and pnp transistors.
- c) State two applications of tunnel diode.
- d) Define bandwidth of Amplifier.
- e) Draw symbols of
- (i) LED and
- (ii) Tunnel diode
- f) Give the applications of IC (any two)
- g) State the need of filter.

P.T.O.

- h) Write two applications of oscillators.
- i) Define static resistance and dynamic resistance of diode.
- j) Give classification of IC_s .
- k) Draw circuit diagram of two stage RC coupled transistor amplifier.
- l) Draw symbols of fixed and variable capacitor.

2. Attempt any FOUR of the following: 16

- a) State the different types of Resistor. State any four specifications of Resistors.
- b) Explain operating principle of Varacter Diode.
- c) Explain operation of npn transistor with neat diagram.
- d) Compare BJT and JFET.
- e) Explain operation of P - N junction in forward biased condition.
- f) Draw and explain direct coupled amplifier with its frequency response.

3. Attempt any FOUR of the following: 16

- a) Draw and explain construction of LDR. Also explain its working principle.
- b) Explain the mechanism of zener breakdown in zener diode.
- c) Draw the construction of n - channel JFET and describe its working.
- d) Draw and explain circuit diagram of crystal oscillator.
- e) Define current gain and voltage gain. What is the need for multistage amplifiers?
- f) A transistor has $\beta = 100$. If its collector current (I_C) = 50 mA, What is the value of I_B and I_E ?

- 4. Attempt any FOUR of the following:** **16**
- a) Draw and explain V - I characteristics of P - N junction diode.
 - b) Differentiate between half wave rectifier and centre tapped full wave rectifier. (four points)
 - c) Draw the circuit diagram of single stage CE amplifier. State functions of each component.
 - d) Draw circuit diagram of bridge rectifier along with its input and output waveforms.
 - e) Explain drain characteristics of JFET with neat diagram.
 - f) Define drain resistance, transconductance, amplification factor and input resistance.
- 5. Attempt any FOUR of the following:** **16**
- a) Explain the operating principle of LED. State any two applications of LED.
 - b) Explain the working of centre tapped full wave rectifier with neat diagram and also draw its input and output waveform.
 - c) Explain the working of zener diode as voltage regulator.
 - d) Draw the circuit of astable multivibrator using transistor. State its two applications.
 - e) Draw and explain V - I characteristics of schotkky diode.
 - f) Draw and explain transformer coupled amplifier with its frequency response.

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

- a) Differentiate between P - N junction diode and zener diode.
(Any four points)
- b) Draw block diagram of regulated power supply. Draw output voltage waveforms at each block.
- c) Draw circuit diagram of voltage divider biasing circuit and state its two advantages.
- d) State and explain Barkhausen's criteria for oscillator.
- e) Explain the working principle and MOSFET with a suitable diagram.
- f) An ac supply of 230 V is applied to half wave rectifier circuit through transformer of turns ratio 2:1.

Calculate:

- (i) DC output voltage and
 - (ii) PIV of a diode.
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