

17213

14115

3 Hours / 100 Marks

Seat No.

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- 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) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
 - (6) Preferably, write the answers in sequential order.

Marks

1. **Attempt any TEN of the following:** **20**
- a) Define active and passive components.
 - b) Draw the symbol of N-channel and P-channel JFET.
 - c) Give the two applications of light emitting diode.
 - d) Define current gain and voltage gain of common emitter amplifier.
 - e) List the four specifications of PN junction diode.
 - f) Give four advantages of IC's.
 - g) Draw the circuit diagram of CLC filter.
 - h) Define transconductance (g_m) and amplification factor (μ) for a JFET.
 - i) Draw the symbol of zener diode and tunnel diode.
 - j) Give the four applications of analog IC's.
 - k) Draw the symbol of NPN and PNP transistor.
 - l) Draw the symbol of variable resistor and electrolytic capacitor.

P.T.O.

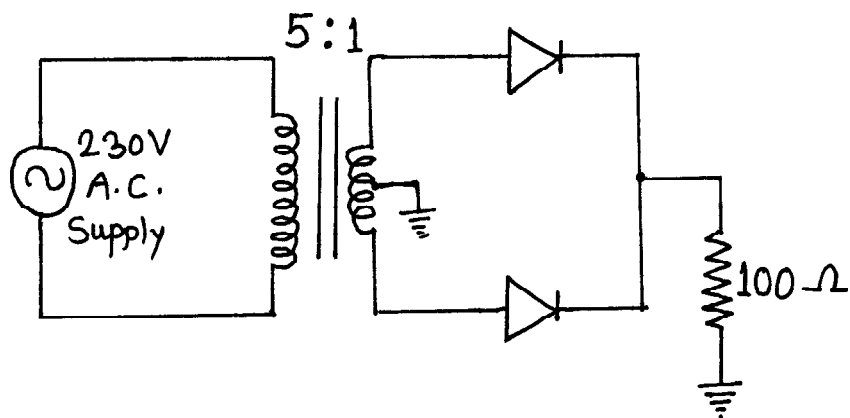
- 2. Attempt any FOUR of the following:** **16**
- a) Give the four applications of electronics in medical field.
 - b) Explain the working principle of varactor diode.
 - c) Explain the working of PNP transistor with the help of constructional diagram.
 - d) Explain the working of single stage CE amplifier with the help of circuit diagram.
 - e) Draw the experimental set-up for obtaining the reverse characteristics of a zener diode and draw its V-I characteristics for the same.
 - f) A crystal oscillator has $L = 0.33 \text{ H}$, $C = 0.065 \text{ PF}$. Find the series resonant frequency.
- 3. Attempt any FOUR of the following:** **16**
- a) Compare VDR and LDR on the basis of working principle and characteristics.
 - b) Explain the operating principle and characteristics of LED.
 - c) Draw the construction of P-channel JFET and explain the formation of depletion layer.
 - d) Compare CE and CB configuration on the basis of:
 - (i) input impedance
 - (ii) output impedance
 - (iii) current gain and
 - (iv) voltage gain.
 - e) A transistor has $I_B = 105 \mu\text{A}$ and $I_C = 2.05 \text{ mA}$. Find β and α of the transistor.
 - f) Draw the circuit diagram of crystal oscillator and write the expression for frequency of oscillation.

- 4. Attempt any FOUR of the following:** **16**
- a) Give four applications of Schottky diode.
 - b) State the need of rectification.
 - c) State advantages of FET over BJT (any four).
 - d) Draw and explain the working of choke input (OR LC) filter.
 - e) Draw the frequency response curve of a single stage RC coupled amplifier. Explain its behaviour at low frequencies and high frequencies (i.e. below 50 Hz and above 20 KHz respectively).
 - f) Draw the circuit diagram of transformer coupled amplifier and its frequency response.
- 5. Attempt any FOUR of the following:** **16**
- a) Explain the operating principle of P-N junction diode under forward bias condition.
 - b) State the four advantages of centre-tapped full wave rectifier over half wave rectifier.
 - c) Draw the experimental setup to plot input and output characteristics of CE configuration and label them.
 - d) Draw the circuit diagram of bistable multivibrator using transistor and explain its working.
 - e) List two advantages and two disadvantages of direct coupled amplifier over RC coupled amplifier.
 - f) Draw and describe zener diode voltage regulator.

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

16

- a) Define the following terms with respect to PN junction diode:
 - (i) static resistance
 - (ii) dynamic resistance.
- b) What is a voltage regulator? State the necessity of voltage regulator.
- c) State the need of biasing for transistor. Draw the circuit diagram of voltage divider biasing.
- d) Write two applications of astable multivibrator and two applications of bistable multivibrator.
- e) Draw the drain characteristics of JFET and show the different regions on it.
- f) Following figure shows a centre tapped full wave rectifier circuit.

**Fig. No. 1**

Assuming both the diodes to be ideal, determine:

- (i) d.c. output voltage (V_{dc}) and
- (ii) peak inverse voltage (PIV) of diode.