

22213

23242

3 Hours / 70 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 FIVE of the following:** **10**
- a) List the applications of LED (any 2).
 - b) State the function of :
 - i) Emitter
 - ii) Base
 - iii) Collectorw.r.t. transistor
 - c) Define Filter. State it's types.
 - d) Write down IC names to obtain +8V and –15V.
 - e) State the Knee voltage for Ge and Si diode.
 - f) Name the universal gates.
 - g) Define the term line regulation and load regulation.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Sketch V – I characteristics of P – N junction diode and describe it.
 - b) Sketch circuit diagram and Input - Output Waveforms of Center-tap Fullwave Rectifier.
 - c) Describe the operation of NPN transistor with neat diagram.
 - d) Describe the working of Zener diode as a voltage Regulator.
- 3. Attempt any THREE of the following:** **12**
- a) Compare LC and RC oscillators (any four points).
 - b) Sketch block diagram of DC regulated power supply. State the function of each block.
 - c) Describe C-Filter with bridge Fullwave rectifier with neat circuit diagram.
 - d) Describe transistor as a switch.
- 4. Attempt any THREE of the following:** **12**
- a) Sketch the circuit diagram of Colpitt's oscillator and describe it's working.
 - b) A transistor has β of 90. If the collector current is equal to 15 mA. Calculate
 - i) Base Current
 - ii) Emitter Current
 - c) Describe working of power IGBT.
 - d) Define Rectifier. Give classification of it. State the need of rectifier.
 - e) Compare half wave rectifier and full wave rectifier.

5. Attempt any TWO of the following: 12
- a) Define and α and β . Derive relation between α and β of the transistor.
 - b) Implement the basic logic gates using NAND gate.
 - c) Construct a dual regulated power supply for giving $\pm 15V$ using 78 XX and 79XX IC's.
6. Attempt any TWO of the following: 12
- a) Describe with neat diagram V – I characteristics of common emitter configuration of transistor.
 - b) Convert the following:
 - i) $(736)_8 = (?)_2$
 - ii) $(FD4)_{16} = (?)_8$
 - iii) $(628)_{10} = (?)_{16}$
 - c) Sketch a neat circuit diagram of RC phase shift oscillator. Calculate the frequency of oscillation for RC phase shift oscillator for the component values
 $R = 8.2 \text{ k}\Omega$, $C = 0.01 \text{ }\mu\text{F}$, $R1 = 1.2 \text{ k}\Omega$
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