

22213

12223

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) State the applications of LASER DIODE.
 - b) List configuration of BJT.
 - c) Define rectifier and list its types.
 - d) Write down IC names to obtain +5V and –12V.
 - e) Ge diode knee voltage is lower than Si diode knee voltage. Justify.
 - f) Define the term load regulation.
 - g) Draw the truth table, symbol of OR gate.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Sketch reverse biased characteristic of zener diode and PN junction diode.
 - b) Sketch circuit diagram and input output waveform of Half wave rectifier. State its efficiency.
 - c) Describe the operation of NPN transistor with neat diagram.
 - d) Sketch block diagram of D.C. regulated power supply. State the function of each block.
- 3. Attempt any THREE of the following:** **12**
- a) Explain with circuit diagram operation of Zener diode as a voltage regulator.
 - b) Differentiate between Positive and Negative feedback on the basis of
 - i) Overall phase shift
 - ii) Voltage gain
 - iii) Stability
 - iv) Applications
 - c) Describe transistor as a switch.
 - d) List out advantages and disadvantages of bridge rectifier.
- 4. Attempt any THREE of the following:** **12**
- a) Sketch circuit diagram of crystal oscillator. State its any two advantages.
 - b) Draw and explain Half wave rectifier.
 - c) In a common base configuration current amplification factor is 0.8. If emitter current is 1mA. Determine the value of base current.
 - d) Describe the working principle of photodiode with proper diagram.
 - e) Define filter, state its need, give its classification.

5. Attempt any TWO of the following:**12**

- a) Define α , β and γ of transistor and give the relation between α , β and γ of the transistor.
- b) Construct a dual regulated power supply capable of giving $\pm 12V$ using 78XX and 79XX IC'S.
- c) Implement the basic logic gates (AND, OR, NOT) using NOR gate.

6. Attempt any TWO of the following:**12**

- a) Sketch circuit diagram of RC Phase shift oscillator if the value of capacitor $C = C_1 = C_2 = C_3 = 5\text{pf}$ and frequency of oscillation is 800 Hz. Calculate value of resistor R ($R = R_1 = R_2 = R_3$)
 - b) Draw the characteristics of common emitter and explain active, saturation and cut off region in detail.
 - c) Convert:
 - i) $(384)_8 = (?)_2$
 - ii) $(513)_{10} = (?)_2$
 - iii) $(225)_{10} = (?)_{16}$
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