22213

22223

3 Hours / 70 Marks Seat No. | | | | | | | | |

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) 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) Draw the symbol of LED and PN junction diote.

b) Name the circuit to obtain D.C. signal from A.C. signal.

c) State relation between emitter current (IE) base current (IB) and collector current (IC) of BJT.

d) Draw pin configuration of IC723.

e) List any two applications of zener diode.

f) Write three terminal voltage regulator IC for obtaining :
   i) +5V
   ii) –12V

g) Draw symbol and write truth table of EX-OR gate.

Marks

2. Attempt any THREE of the following **12**

a) Draw and explain V-I characteristics of PN junction diode.

b) Explain center tapped full wave rectifier with the help of circuit diagram and draw input, output waveforms.

c) Compare CB, CE and CC configuration (Any four points)

d) Explain with circuit diagram operation of zener diode as a voltage regulator.

3. Attempt any THREE of the following **12**

a) Draw the block diagram of regulated DC power supply and explain the function of each block.

b) Sketch circuit diagram of Hartely oscillator. State expression for frequency of oscillation.

c) Describe transistor as a swithch with neat sketch.

d) In full wave bridge rectifier Vm = 10V, RL = 10KΩ. Find out V_{DC}, I_{DC}, ripple factor and PIV.

4. Attempt any THREE of the following **12**

a) Compare positive and negative feedback (Any four points).

b) Draw the circuit diagram of bridge rectifier with π filter. Draw its input and output waveform.

c) In a common base connection, current amplification factor (α) is 0.9. If the emitter current is IMA, determine the value of base current and collector current.

d) Describe the working principle of photodiode with proper diagram.

e) Name the type of rectifier for each of following feature:

i) Highest rectifier efficiency

ii) Highest form factor

iii) Two diode rectifier circuit

iv) PIV = 2Vm.

Marks

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

a) Define α and β of transistor and derive the relation between them.

b) Construct a dual regulated power supply capable of giving ±12V using 78XX and 79XX IC'S.

c) Implement the fundamental logic gates 'OR' gate, 'AND' gate, 'NOT' gate using only NAND gates.

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

a) Sketch circuit diagram of RC phase shift oscillator. If the value of capacitor. $C = C_1 = C_2 = C_3 = 5pf$ and frequency of oscillation is 800Hz, calculate value of resistor R_1 $(R = R_1 = R_2 = R_3)$.

b) Draw output characteristics of common emitter (CE) configuration and explain active, saturation and cut off regions in detail.

c) Convert the following numbers:

i) $(11010010)_2 = (?)_8$

ii) $(109)_{10} = (?)_2$

iii) $(6A)_{16} = (?)_{10}$