# 22213

**23242**

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

*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) Collector
   w.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.

**Marks**

**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 $\beta$ 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.

**Marks**

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

a) Define and $\alpha$ and $\beta$. Derive relation between $\alpha$ and $\beta$ of the transistor.

b) Implement the basic logic gates using NAND gate.

c) Construct a dual regulated power supply for giving ± 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 k$\Omega$, C = 0.01 $\mu$I, R1 = 1.2 k$\Omega$