22213

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) 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 symbol of:

(i) PN junction diode

(ii) LED

b) Name the different types of filter.

c) Define current gain of a transistor.

d) Define load and line regulation.

e) List any two applications of zener diode.

f) Draw pin configuration of IC 723.

g) Define Demorgans theorem first and write it's equation.

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

   a)　Describe the operating principle of Light Emitting Diode (LED) with neat diagram.

   b)　Draw the circuit diagram of full wave bridge rectifier and describe its working.

   c)　Describe the working of NPN transistor with a neat sketch.

   d)　Draw the block diagram of regulated power supply and state the function of each block.

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

   a)　Draw circuit diagram and describe the working of zener diode as voltage regulator.

   b)　Draw the circuit diagram of crystal oscillator. Give the basic principle of working of piezoelectric crystal and give the equivalent circuit diagram.

   c)　Draw the output characteristic of CE (Common Emitter) configuration and label various regions.

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

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

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

   b)　With the help of circuit diagram and waveform, describe the working of π type filter.

   c)　For a transistor α = 0.98 and IC = 4 mA. Calculate IB and IE.

   d)　Draw labelled VI characteristic of PN junction diode and explain.

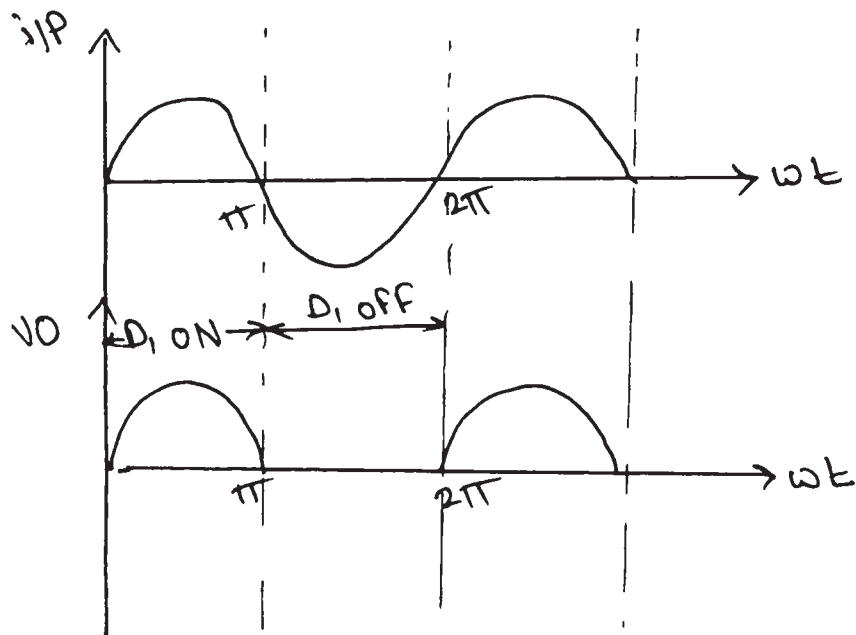   e)　Draw the circuit diagram for the following input-output waveform of rectifier (Refer Fig. No. 1 and Fig. No. 2)
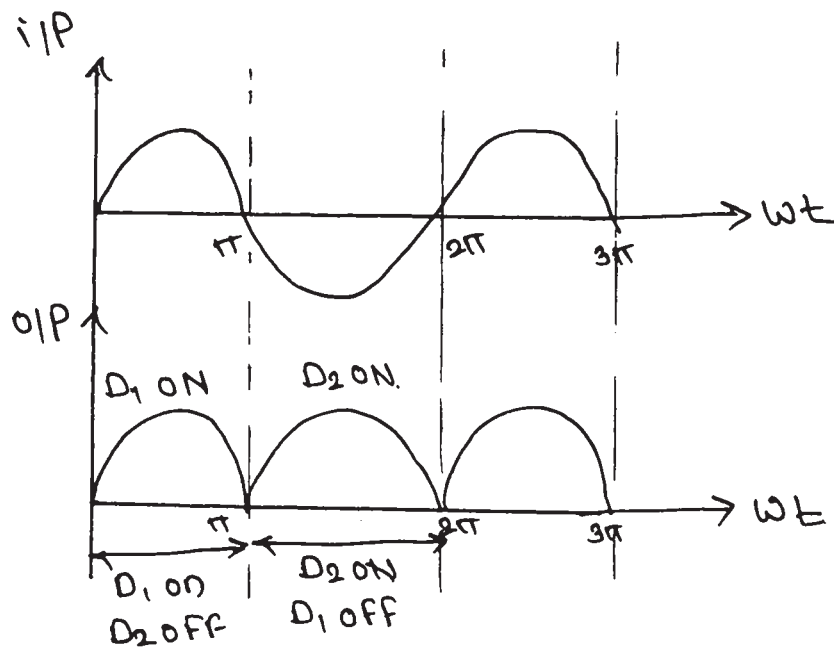
Fig. No. 1

Fig. No. 2

Marks

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 ± 12 V using 78 XX and 79 XX IC's.

c) Define universal gate and implement NAND gate as a OR gate and EX-OR gate.

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

a) Draw RC phase shift oscillator and determine frequency of oscillation? How can the frequency of oscillator be changed.

b) Describe the working of transistor as a switch with a circuit diagram.

c) Convert:

(i) $(1101101)_2 = ($? $)_8$

(ii) $(513)_{10} = ($? $)_2$

(iii) $(125)_{10} = ($? $)_{16}$

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