22213

11920

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) Draw symbols of zener diode and LED

b) List the types of filters.

c) Draw symbol of NPN and PNP transistor

d) Define the term line regulation and load regulation.

e) Suggest the diode material suitable to rectify 0.5V AC signal.

f) Draw circuit of zener diode as a voltage regulator.

g) Draw truth table for logic gates represented by following IC's:

(i) IC 7400

(ii) IC 7402

Marks

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

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

b) Explain shunt capacitor filter with the help of circuit diagram and waveform.

c) Compare CB, CE, CC configuration of BJT with respect to following points.

(i) Input Impedance

(ii) Output Impedance

(iii) Current gain

(iv) Voltage gain

d) Draw the functional block diagram of IC 723. State any two features of IC 723.

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

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

b) State and explain Barkhausen's criteria required for Oscillations.

c) State the need of biasing of BJT. List types of biasing.

d) A half wave rectifier is used to supply 50V DC to a resistive load of 1KΩ. The diode has a resistance of 10Ω. Calculate required input AC voltage.

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

a) Draw the circuit diagram of crystal oscillator and give the basic principle of piezoelectric crystal.

b) Compare half wave rectifier and full wave rectifier with respect to:

(i) PIV

(ii) Ripple Frequency

(iii) TUF

(iv) Efficiency

Marks

c) In a common base configuration, current amplification factor is 0.8. If emitter current is 2mA, determine the value of base current.

d) Describe the operating principle of LASER diode with constructional diagram.

e) List out advantages and disadvantages of bridge rectifier.

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

a) Draw frequency response of two stage RC coupled amplifier. Write procedure to calculate bandwidth and state any two methods to improve bandwidth.

b) State the need of regulator. Draw circuit diagram of DC regulated dual power supply for ±12V using IC's 78XX and 79XX

c) State race around condition. Draw the circuit diagram of master slave JK flipflop using NAND gates and explain it's operation.

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

a) List two applications of oscillator. Calculate the frequency of oscillation for RC phase shift oscillator for the components values R = 8·2KΩ, C = 0·01μF, R_1 = 1·2KΩ, R_F = 39KΩ.

b) Define transistor. Explain how transistor works as a switch with input and output waveforms.

c) Draw implementation of EX-OR and EX-NOR logic gate using NAND and NOR gate.