17321

21314

3 Hours/100 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) Mobile Phone, Pager and any other Electronic Communication devices are ***not permissible*** *in Examination Hall.*

MARKS

1. A) Attempt **any six** of the following : **12**

a) Define knee voltage and reverse saturation current of diode.

b) List various transistor biasing methods.

c) Define α and β of transistor.

d) Draw a functional pin diagram of IC 723.

e) Draw logic symbol and truth table of OR gate and EX-NOR gate.

f) State Barkhausen criteria for oscillation.

g) Draw the symbol and list one application of :

i) Schottkey diode

ii) Varacter diode.

h) Give four applications of digital electronics.

i) What is filter ? List the types of filter.

B) Attempt **any two** of the following : **8**

a) Draw experimental set up to obtain forward characteristics of p-n junction diode. Draw forward characteristics and explain it.

b) Compare full wave rectifier and half wave rectifier (4 points).

c) Describe the operation of npn transistor with diagram.

P.T.O.

MARKS

2. Attempt **any four** of the following : **16**

   a) Draw forward and reverse characteristics of zener diode with neat circuit diagram.

   b) Draw the circuit diagram of Bridge Rectifier with π filter. Draw its input and output waveforms.

   c) Describe transistor as a switch with neat sketch.

   d) Derive the relationship between α and β.

   e) Describe the operation of p-channel FET with diagram.

   f) Describe the operation of zener diode as voltage regulator with diagram.

3. Attempt **any four** of the following : **16**

   a) Describe the working principle of LED with diagram.

   b) A CE configuration of transistor if β = 100, leakage current I_{CEO} = 150 μ A, I_B = 0.2 mA. Calculate IC and IE.

   c) Draw VE-IE characteristics of UJT. Describe the different regions on characteristics.

   d) Compare BJT and FET (4-points).

   e) Describe the operation of transistorized shunt regulator with diagram.

   f) Draw the block diagram of microprocessor. State the function of each block.

4. Attempt **any four** of the following : **16**

   a) Differentiate between Class A and Class B power amplifier (4-points).

   b) Describe the working principle of LASER diode with diagram.

   c) Draw input and output characteristics of CE configuration and shows various regions on characteristics.

MARKS

d) Draw the circuit diagram of single stage CE amplifier. Give the function of each components.

e) Define the terms related to FET :

i) Drain resistance

ii) Transconductance

iii) Amplification factor

iv) Pinchoff voltage.

f) Draw the circuit diagram of dual regulator using regulator IC's 7812 and 7912 and give the function of each components.

5. Attempt **any four** of the following : **16**

a) Describe the operation of N-channel enhancement type MOSFET with diagram.

b) Draw the circuit diagram of two stage transformer coupled amplifier. Give advantages and disadvantages of it.

c) Describe voltage divider bias method with the help of diagram.

d) An AC supply of 230 V is applied to half wave rectifier circuit. A transformer turns ratio is 10 : 1. Find :

i) Output DC voltage

ii) Peak inverse voltage.

e) Draw the circuit diagram of Hartley oscillator and give the function of each components.

f) Describe how the oscillations are maintained in crystal oscillator with diagram.

MARKS

6. Attempt **any four** of the following : **16**

a) Draw the circuit diagram of RC phase shift oscillator. Derive the equation for frequency oscillation.

b) Draw the circuit diagram of colpitts oscillator. A colpitt oscillator has $C_1 = 250$ PF, $C_2 = 100$ PF and L = 60 μ H. Find the value of frequency of oscillation.

c) Why NOR gate is called universal gate ? Implement OR, AND gate using NOR gate.

d) Draw the block diagram of DC power supply. Give the function of each block.

e) Describe the operation of two stage R-C coupled amplifier with diagram.

f) Comparison between CB and CC configuration of transistor (4-points).