17321

14115

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

MARKS

1. Answer **any 10** of the following : **20**

a) Define doping. State any 2 trivalent impurities.

b) Draw V-I characteristics of PN junction diode and give the rated value of cut in voltage for Si and Ge.

c) Compare LED and photodiode on basis of

a) Working principle

b) Biasing used

c) Symbol

d) Application.

d) State the need of filters in a DC regulated power supply.

e) Draw circuit diagram of transistor as a switch. State its voltage and current level in ON and OFF condition.

f) Draw symbol of E-MOSFET (nch.) and D-MOSFET (n channel).

g) State advantages of transistorized voltage regulator over Zener voltage regulator.

h) Define bandwidth of an amplifier.

i) State Barkhausen's criteria for sustained oscillations.

j) Convert :

i) $(256)_D = (\ )_B$

ii) $(6A)_H = (\ )_D$

P.T.O.

MARKS

k) Draw symbol of AND gate. State its truth table and write its Boolean expression.

l) State the meaning of cross-over distortion w.r. to class B push pull amplifiers.

m) Draw characteristics of UJT and label its regions.

n) Which BJT biasing circuit is popularly used ? State the reason why it is used.

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

a) Differentiate between BJT and FET on basis of

i) Input impedance

ii) Control factor

iii) Bipolar/Unipolar

iv) Thermal stability.

b) Draw and state the working principle of LED with neat well labeled diagram.

c) Draw symbol of point contact diode. State its working principle. Give any two applications.

d) Draw circuit diagram of full wave centre tap rectifier with LC filter along with its input/output waveforms.

e) Draw circuit diagram of Hartley oscillator. Give function of each component in it. State its frequency equation.

f) State advantages and disadvantages of transistorised series voltage regulator (any four points).

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

a) Differentiate between class A and class B amplifier on basis of :

a) Q-point

b) Collector current waveform

c) Distortion

d) Efficiency.

b) Sketch typical UJT characteristics. Label each region and all important points on the characteristics.

c) Construct OR gate using NAND gate.

MARKS

d) Draw and explain frequency response of single stage amplifier.

e) Draw symbol of varactor diode. State reason why it is called vari-cap.

f) What is the need of a regulated power supply ? Define load and line regulation with ref. to regulator.

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

a) State the principle of crystal oscillator. Draw circuit diagram of a crystal oscillator. Give its working with respect to the function of each component.

b) Draw CE output characteristics. Label the regions in it and give application of each region.

c) Draw circuit diagram of voltage divider biasing of BJT. How stability is achieved in Q-point.

d) Draw transformer coupled class A power amplifier.

e) State the three parameters of JFET. Give relation between them.

f) Draw Zener diode as a voltage regulator. State the conditions in which voltage is stabilized.

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

a) Draw basic block diagram of microprocessor. State function of each block in it.

b) State application of digital systems. Draw a analog and digital signal. State its important features.

c) With a neat circuit diagram, explain the principle of operation of RC phase shift oscillator.

d) Draw pin diagram of 723. Give advantages of IC voltage regulators over discrete voltage regulators.

e) Compare E-MOSFET and D-MOSFET on basis of : application, mode of operation, channel, symbol.

f) Compare CB, CE, CC configuration on basis of voltage gain, current gain, input impedance, output impedance.

MARKS

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

a) Draw and explain working principle of NPN transistor.

b) Compare HW, FW bridge and FW center tap on basis of PRV, ripple factor, efficiency, TUF.

c) State specifications of Zener diode. Draw symbol and characteristics of Zener diode. Label all regions in it.

d) Draw circuit diagram of 2 stage direct coupled amplifier. Explain its frequency response.

e) List types of amplifier coupling. Draw circuit diagram of amplifier used in Audio frequency range. Explain the components used in it.

f) Draw circuit diagram of a fridge rectifier. State function of diode and working in both the half cycles with waveforms.
