17319

16117

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

a) Draw symbol of NPN and PNP transistor.
b) What are different types of amplifier coupling ?
c) Define intrinsic stand off ratio for UJT.
d) List various transistor biasing methods.
e) State the effect of VGS on channel conductivity on N-channel JFET.
f) What is thermal runaway ? How it can be avoided ?
g) State the need of regulator.
h) State the conditions for sustained oscillations.

B) Attempt **any two** : **8**

a) Draw the output characteristics of common emitter configuration. What is the effect of base current I_B on collector current I_C with reference to characteristics ?
b) Draw the circuit diagram of voltage divider biasing method of BJT. How stability in operating point is obtained ?
c) Draw circuit diagram of transistorized series voltage regulator and explain its working.

2. Attempt **any four** : **16**

a) With the help of neat circuit diagram, explain the working of fixed bias method for BJT.
b) Describe the working principle of N-channel JFET with diagram.
c) Draw transistor as switch. What is voltage across transistor (V_{CE}) and current through transistor (I_C) when transistor is ON and OFF ?
d) Draw block diagram of voltage shunt and voltage series feedback.
e) Draw the block diagram of regulated power supply. Write the function of each block.

P.T.O.

Marks

3. Attempt **any four** : **16**

a) Compare CB, CE, CC configuration of BJT with reference to following points.
   i) Input impedance
   ii) Output impedance
   iii) Current gain
   iv) Voltage gain.

b) With the help of neat circuit diagram, explain the working of self bias method for FET.

c) Draw circuit diagram of UJT Relaxation Oscillator and describe its working principle.

d) Draw circuit diagram of two stage RC coupled amplifier. State the need of multistage amplifier.

e) Draw and describe working of Zener diode as voltage regulator.

f) Sketch pin diagram of IC 723. Give any four advantages of IC voltage regulator over discrete voltage regulator.

4. Attempt **any four** : **16**

a) Draw transfer and drain characteristics of JFET. Give relation between μ, r, d.

b) Draw the circuit diagram of double tuned amplifier and describe its working.

c) Explain the working of N-channel E-MOSFET.

d) Explain class B push-pull amplifier with neat diagram.

e) Differentiate between class A and class B amplifier on the following basis.
   i) Position of Q points on load line
   ii) Distortion in output voltage
   iii) Collector current waveform
   iv) Efficiency.

f) Describe working of bootstrap time base generator with circuit diagram.

5. Attempt **any four** : **16**

a) Define α, β with respect to transistor configuration. State the relation between α and β.

b) For RC phase shift oscillator the components values are as follows : $R = 8.2\ k\Omega$, $C = 0.01\ \mu f$, $R_1 = 1.2\ k\Omega$, $R_F = 39\ k\Omega$. What will be the frequency of oscillation ?

c) Draw the circuit diagram of single stage class A power amplifier and describe its working.

d) How FET can be used as an amplifier ? Explain with neat sketch.

e) Draw the circuit diagram of crystal oscillator, and give the basic principle of Piezoelectric crystal.

f) Draw Miller sweep generator and give any two applications.

Marks

6. Attempt **any four**: **16**

a) In CE configuration if $\beta = 98$, leakage current $I_{CEO} = 50\ \mu A$. If base current is 0.5 mA. Determine I_C and I_E.

b) Distinguish between series and shunt voltage regulator (any four points)

c) State the effect of negative feedback on following parameter

i) Bandwidth

ii) Noise

iii) Gain

iv) Distortion

d) Draw circuit diagram of two stage transformer coupled amplifier. Draw its frequency response.

e) Sketch neat labelled VI characteristics of unijunction transistor.

f) Draw circuit diagram of single stage CE amplifier and state function of each component.