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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) 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 the symbols of schottkey diode and photo diode.

b) State different biasing methods of BJT.

c) Compare RC coupled and transformer coupled amplifier (Any two points)

d) Define μ and γ_d of JFET.

e) Define line regulation and load regulation.

f) State the need of multistage amplifiers.

g) Draw the circuit diagram of direct coupled amplifier.

Marks

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

a) Describe the working of PN junction diode in forward bias with neat labelled diagram.

b) Draw functional block diagram of IC 723.

c) Explain the working of transistor as a switch.

d) Draw the circuit diagram of center-tap full wave rectifier with π filter. Also draw associated Input/output voltage waveforms.

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

a) Draw the circuit diagram of two stage RC coupled amplifier. Also draw its frequency response.

b) Compare BJT and FET (Any four points)

c) Explain the working of NPN transistor with neat constructional diagram.

d) Compare CB, CE and CC configurations (Any four points)

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

a) Compare PN junction diode and zener diode based on –

i) Symbol

ii) Biasing

iii) Type of Breakdown

iv) Application

b) Describe working of DMOSFET with the help of neat constructional diagram.

c) Name the IC number to obtain following voltages.

i) +5 V

ii) –12 V

iii) +18 V

iv) –24 V

Marks

d) Explain voltage divider biasing method of transistor with the help of neat circuit diagram.

e) Give classification of amplifiers based on –

i) Configuration

ii) Coupling

iii) Class of operation

iv) Frequency response.

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

a) Justify the use of CE configuration in transistor amplifiers with respect to DC load line and operating point.

b) Compare Half wave rectifier and Bridge rectifier based on –

i) Output voltage waveform

ii) V_{DC}

iii) Efficiency

iv) Ripple factor

v) Ripple frequency

vi) TUF

c) For a N-channel EMOSFET answer the following :

i) Draw construction

ii) Explain its working with neat labelled characteristics.

Marks

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

a) Draw basic block diagram of DC regulated power supply. Explain function of each block.

b) For a P-channel JFET answer the following :

i) Draw transfer characteristics.

ii) If $I_{DSS} = 6\,mA$ and $V_P = -4.5\,V$

c) For a transistor $I_C = 50\,mA$ and $\beta = 100$ answer the following.

i) Define α and β of transistor.

ii) Calculate the value of α.

iii) Find I_E and I_B.