17213

15116

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) 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 TEN of the following: **20**

a) Define active components. Give one example.

b) Draw symbols of npn and pnp transistors.

c) State two applications of tunnel diode.

d) Define bandwidth of Amplifier.

e) Draw symbols of

(i) LED and

(ii) Tunnel diode

f) Give the applications of IC (any two)

g) State the need of filter.

P.T.O.

Marks

h) Write two applications of oscillators.

i) Define static resistance and dynamic resistance of diode.

j) Give classification of $IC_{s.}$

k) Draw circuit diagram of two stage RC coupled transistor amplifier.

l) Draw symbols of fixed and variable capacitor.

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

a) State the different types of Resistor. State any four specifications of Resistors.

b) Explain operating principle of Varacter Diode.

c) Explain operation of npn transistor with neat diagram.

d) Compare BJT and JFET.

e) Explain operation of P - N junction in forward biased condition.

f) Draw and explain direct coupled amplifier with its frequency response.

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

a) Draw and explain construction of LDR. Also explain its working principle.

b) Explain the mechanism of zener breakdown in zener diode.

c) Draw the construction of n - channel JFET and describe its working.

d) Draw and explain circuit diagram of crystal oscillator.

e) Define current gain and voltage gain. What is the need for multistage amplifiers?

f) A transistor has $\beta = 100$. If its collector current $(I_C) = 50$ mA, What is the value of I_B and I_E ?

Marks

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

a) Draw and explain V - I characteristics of P - N junction diode.

b) Differentiate between half wave rectifier and centre tapped full wave rectifier. (four points)

c) Draw the circuit diagram of single stage CE amplifier. State functions of each component.

d) Draw circuit diagram of bridge rectifier along with its input and output waveforms.

e) Explain drain characteristics of JFET with neat diagram.

f) Define drain resistance, transconductance, amplification factor and input resistance.

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

a) Explain the operating principle of LED. State any two applications of LED.

b) Explain the working of centre tapped full wave rectifier with neat diagram and also draw its input and output waveform.

c) Explain the working of zener diode as voltage regulator.

d) Draw the circuit of astable multivibrator using transistor. State its two applications.

e) Draw and explain V - I characteristics of schotkky diode.

f) Draw and explain transformer coupled amplifier with its frequency response.

Marks

6. Attempt any FOUR of the following: 16

a) Differentiate between P - N junction diode and zener diode. (Any four points)

b) Draw block diagram of regulated power supply. Draw output voltage waveforms at each block.

c) Draw circuit diagram of voltage divider biasing circuit and state its two advantages.

d) State and explain Barkhausen's criteria for oscillator.

e) Explain the working principle and MOSFET with a suitable diagram.

f) An ac supply of 230 V is applied to half wave rectifier circuit through transformer of turns ratio 2:1.

Calculate:

(i) DC output voltage and

(ii) PIV of a diode.

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