2019

B. Sc.

1st Semester Examination

ELECTRONICS (Honours)

Paper : GE 1-P

(Practical)

Electronics Circuit and PCB Designing Lab

Full Marks : 20 Time : 3 Hours

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer *one* question selecting it by a lucky draw.

(Electronic Circuits and PCB Dsigning Lab)

Answer *any one* question selectin by a Lucky draw.

1. Verify Thevenin's theorem by using a resistive Wheatstone bridge network.

   (a) Theory and working formula 3

(b) Circuit diagram 1½

(c) Circuit implementation 1½

(d) Data for load voltage (V_L) and Load current. 5

(e) Determination of V_{Th} and R_{Th} from $I_L - V_L$ graph 3

(f) Accuracy 1

2. Verify Superposition theorem (Taking at least two voltage sources)

(a) Theory 2

(b) Circuit diagram 2

(c) Circuit implementation 2

(d) Data for verification 7

(e) Accuracy 1

(f) Discussion 1

3. Verify Maximum Power transfer theorem by using resistive Wheatstone bridge network.

(a) Theory and working formula 2

(b) Circuit diagram 1½

(c) Circuit impementation 1½

(d) Data for load voltage (V_L) and Load current (I_L). 5

(e) Verification of Maximum power transfer theorem from R_L – P curve 4

(f) Accuracy 1

4. Study the regulation characteristics of a Half Wave rectifier without any filter and with a shunt capacitor filter for a given input. Determine the ripple factor (ν) and percentage regulation in each case.

(a) Working formula and schematic circuit diagram. 2

(b) Circuit implementation 1

(c) Data for voltage regulation and wave form to be studied in CRO and measurement of ripple factor. 6+1+1

(d) Voltage regulation curves. 3

(e) Percentage voltage regulation for a specified current.

5. Study the regulation characteristics of a centre tapped full wave rectifier without any filter and with a shunt capacitor filter for a given input. Determine the ripple factor (ν) and percentage regulation in each case.

   (a) Working formula and schematic circuit diagram. 2

   (b) Circuit implementation 1

   (c) Data for voltage regulation and wave form to be studied in CRO and measurement of ripple factor. 6+1 +1

   (d) Voltage regulation curves 3

   (e) Percentage voltage regulation for a specified current. 1

6. Study the load regulation characteristics of the Zener diode.

   (a) Theory and circuit diagram and circuit implementation. 2 + 1

   (b) Calculation of limiting resistance R_S 1

   (c) Data for regulation curve $V_S = 1{\cdot}6V_Z$, where V_S is the supply voltage and V_Z is the Zener breakdown voltage. 6

(d) Drawing of load regulation curve 3

(e) Percentage regulation at specified load current 1

(f) Accuracy and disenssion 1

7. Draw the static output characteristics of a transistor in common emitter configuration for three different base currents and to determine r_i, r_0 and β_{ac} in the given region.

(a) Theory and circuit diagram and circuit implementation.
2 + 1

(b) Circuit diagram and implementation. 2

(c) Data for output characteristics curves 6

(d) Drawing of curves and calculation of r_i, r_0 and β_{ac} 5

8. Design a CE amplifier with a given transistor [h_{FE} and $(I_B)_{max}$ are to be supplied] for a particular mid-band voltage gain (say $A_V = 50$) and record the data for frequency response for a fixed input voltage and hence find the band with of the amplifier.

(Calculations for the component are to be done)

(a)	Theory and circuit diagram.	3
(b)	Calculations for the components.	2
(c)	Implementation of the circuit.	3
(d)	Data for frequency response curve	5
(e)	Drawing of frequency response curve	2

Distribution of Marks

Experiment	:	15 marks
L.N.B	:	02 marks
Viva-voce	:	03 marks
Total	:	20 marks