 B.Sc.-CBCS/IS/ELECT/H/C1P/17
(Pr.)

2017

ELECTRONICS

(*Basic Circuit Theory and Network Analysis*)

[Honours]

(CBCS)

(Practical)

PAPER – C1P

Full Marks : 20

Time : 2 hours

The figures in the right-hand margin indicate marks

Answer any **one** question, selecting it by a **lucky draw**

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

(*a*) Working formula and schematic circuit diagram. 3

(*b*) Circuit implementation. 2

2. Verify Norton's theorem by using a resistive Wheatstone bridge network :

(*a*) Working formula and schematic circuit diagram. 3

(*b*) Circuit implementation. 2

(*c*) Data for load voltage (V_L) and load current (I_L). 4

(*d*) Draw I_L-V_L graph and determine I_N and R_N from the graph. 4

(*e*) Discussion and Accuracy. 2

3. Verify Maximum power transfer theorem by using a resistive Wheatstone bridge network :

(*a*) Working formula and schematic circuit diagram. 3

(*b*) Circuit implementation. 2

(*c*) Data for load voltage (V_L) and load current (I_L). 4

(*d*) Verification of Maximum Power Transfer theorem from R_L-P curve. 4

(*e*) Discussion and Accuracy. 2

4. Design a first order low pass *RC* filter of cut-off frequency 3 kHz and study its frequency response.

   (*a*) Theory. 3

   (*b*) Circuit diagram and implementation. 2

   (*c*) Record Data for gain *vs*. frequency. 4

   (*d*) Draw the gain *vs*. frequency curve and verify the cut-off frequency. 4

   (*e*) Discussion and accuracy. 2

5. Design a first order high pass *RC* filter of cut-off frequency 1 kHz and study its frequency response.

   (*a*) Theory. 3

   (*b*) Circuit diagram and implementation. 2

   (*c*) Record Data for gain *vs*. frequency. 4

   (*d*) Draw the gain *vs*. frequency curve and verify the cut-off frequency. 4

   (*e*) Discussion and accuracy. 2

(c) Data for load voltage (V_L) and load current (I_L). 4

(d) Draw I_L-V_L graph and determine V_{TH} and R_{TH} from the graph. 4

(e) Discussion and Accuracy. 2

6. To draw the resonance curve of series *LCR* circuit and to find the *Q*-factor :

   (*a*) Theory. 3

   (*b*) Circuit diagram and implementation. 2

   (*c*) Record data for resonance curve (two values of *R*). 4

   (*d*) Draw *I-f* curve and calculate *Q* value. 4

   (*e*) Discussion and accuracy. 2

7. To study the resonance curve of series *LCR* circuit and to find the *Q*-factor from the ratio of $\frac{V_e}{V_i}$ at resonance :

   (*a*) Theory. 3

   (*b*) Circuit diagram and implementation. 2

   (*c*) Record data for resonance curve (two values of *C*). 4

   (*d*) Draw *I-f* curve and calculate *Q* value. 3

(*e*) Compare Q value from resonance curve and $\frac{V_e}{V_i}$ at resonance. 1

(*f*) Discussion and accuracy. 2

Distribution of Marks

Experiment	: 15 marks
Laboratory Note Book	: 02 marks
Viva-voce	: 03 marks
Total	: 20 marks