Bachelor of Science (B.Sc.) Semester—I Examination

ELECTRONICS : ELECTRONICS COMPONENTS AND NETWORK ANALYSIS

Optional Paper—I

Time : Three Hours] [Maximum Marks : 50

Note :—(1) All questions are compulsory.

(2) All questions carry equal marks.

(3) Draw neat diagrams wherever necessary.

EITHER

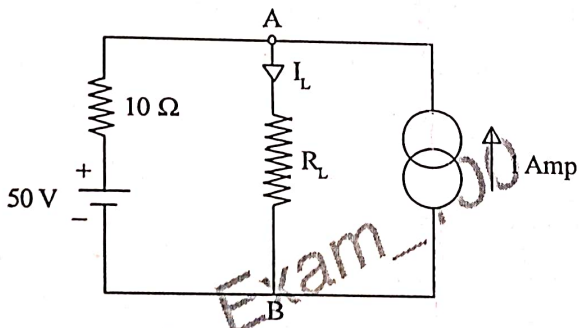
1. (A) What is resistor ? Draw the symbol of resistor. State different types of resistors. List the different functions of resistor. Explain the series and parallel combination of resistor with a suitable diagrams. 1+1+2+2+4=10

OR

(B) What is inductor ? State different types of inductors. List the factors affecting the inductance of an inductor. Explain the construction and working of transformer in brief. 1+1+2+6=10

EITHER

2. (A) State and prove Maximum Power Transfer Theorem. Find the value of load resistance, R_L which will absorb maximum power and determine the maximum power in the network shown :



5+5=10

OR

(B) (i) State and explain Norton's Theorem.

(ii) State and explain Thevenins Theorem. Write the steps to convert Thevenins equivalent circuit into Norton's equivalent circuit with suitable diagram. 4+6=10

EITHER

3. (A) What is sinusoidal waveform ? Explain the generation of alternating voltage using rotary generator. Define the following terms for AC.

(i) Peak Value

(ii) Average Value

(iii) RMS Value

Explain the concept of phase angle with phasor diagram. 1+4+3+2=10

OR

(B) What is impedance ? Explain capacitive and inductive reactance. 1+2+2=5

(C) Define Resonance. Explain Parallel Resonance Circuit with Parallel Resonance Curve. 1+4=5

EITHER

4. (A) Describe the construction and working of a Linear Variable Differential Transducer (LVDT) in detail. List the advantages and disadvantages of LVDT. 8+2=10

OR

(B) What is Piezoelectric effect ? Explain the process of generation of electrical charges in piezoelectric crystal. Draw the diagram of piezoelectric transducer and explain its working in brief. 2+4+4=10

5. Solve any TEN :

(a) Draw the symbol of SPDT switch.

(b) What is relay ?

(c) What is Capacitor ? Draw the symbol of variable capacitor.

(d) Draw the circuit symbol of ideal and practical voltage source.

(e) State Superposition Theorem.

(f) State KCL.

(g) Write the unit of frequency of sine wave.

(h) Define RMS Value of sine wave.

(i) What is bandwidth ?

(j) What do you understand by the term PTC with respect to thermistor ?

(k) What is active transducer ?

(l) What is Thermocouple ? 1×10=10