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

ELECTRONICS

Compulsory Paper—I

(Electronic Components, Network Theorems)

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) All questions are compulsory and carry equal marks.

(2) Draw neat and well labelled diagrams wherever necessary.

EITHER

1. (A) What is inductor ? Draw the symbol of inductor. State different types of inductor. Write the factors affecting inductance of an inductor.

Explain the resultant values of series and parallel combination of inductor. 1+1+2+2+4

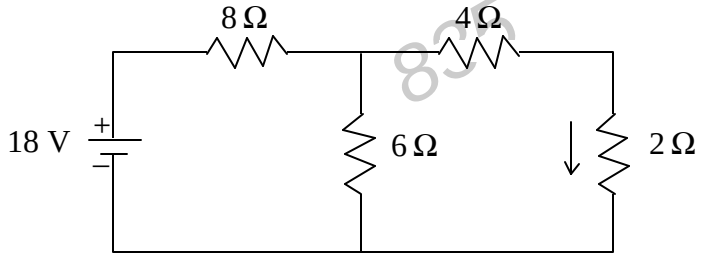
OR

(B) Draw the block diagram of CRO and explain the function of each block in brief. 4+6

EITHER

2. (A) Explain the concept of ideal current source. Discuss the effect of internal resistance on the performance of current source.

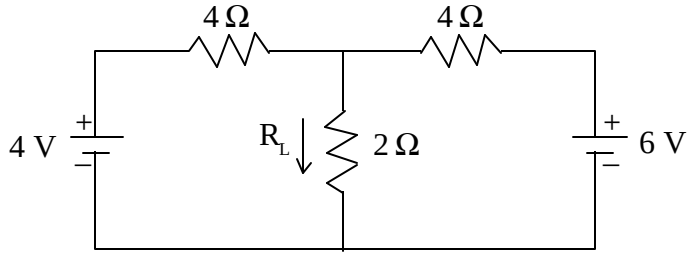
State the Thevenin's theorem. Calculate the current flowing through 2 Ω resistance by using Thevenin's theorem in the following network. 5+5



OR

(B) State and explain KVL and KCL.

State superposition theorem. Determine the value of current flowing through R_L using superposition theorem in the following network. 4+6



EITHER

3. (A) What is intrinsic and extrinsic semiconductor ?
Explain formation of P-type and N-type semiconductor.
Draw and explain energy band diagram for each. 3+4+3

OR

(B) Explain the action of zener diode as a voltage regulation.

Explain working of LED. Draw circuit symbol for LED. State any two applications of LED. 5+5

EITHER

4. (A) Explain the construction and working of NPN transistor.
Draw the circuit diagram of CE, CB, CC modes of transistor. 4+6

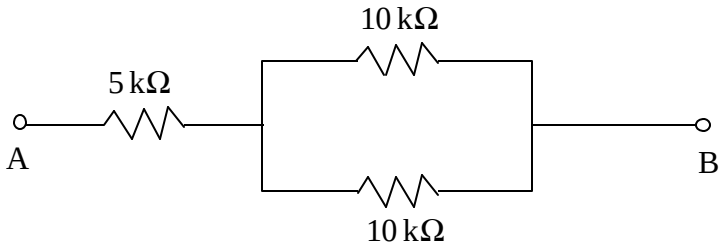
OR

(B) Define α and β of transistor.
Obtain the relationship between α and β of transistor.
Explain using neat circuit diagram the operation of transistor as a switch. 2+3+5

5. Solve any **TEN** :

(A) What is transformer ?

(B) Calculate the equivalent resistance of the following circuit.



(C) State two applications of CRO.

(D) What is the value of internal resistance of an ideal voltage source ?

(E) Give the statement of maximum power transfer theorem.

(F) Draw the circuit for conversion of voltage source to current source.

(G) Why is silicon preferred over germanium in semiconductor devices ?

(H) What is transition capacitance in a junction diode ?

(I) What is cut in voltage ? Give its value for silicon PN junction diode.

(J) Why transistor is called bipolar device ?

(K) State two applications of transistor.

(L) In CE mode transistor, β is 100 and I_B = 50 µA. Calculate I_C and I_E. 1×10=10