NJR/KS/18/3026

Bachelor of Science (B.Sc.) Semester-I (C.B.S.) Examination

ELECTRONICS (Electronic Components, Network Theorems)

Compulsory Paper—1

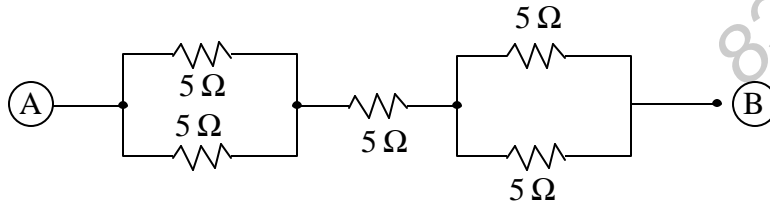Time : Three Hours]   [Maximum Marks : 50

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

(2) Draw diagrams wherever necessary.

EITHER

1. (A) What is Resistor ? State its types. Explain any two applications. Calculate the equivalent resistance of following circuit.   1+2+4+3
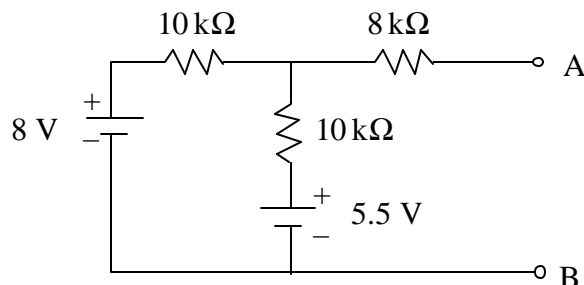

OR

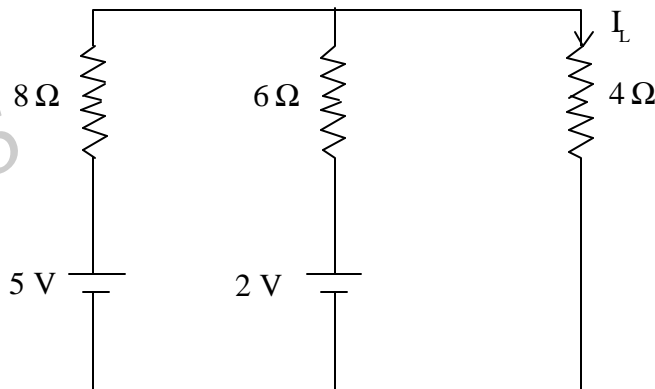(B) Draw the block diagram of CRO. Explain working of each block.   10

EITHER

2. (A) State and explain Norton's Theorem. Replace the following circuit by its Norton's equivalent circuit.   4+6

OR

(B) State and explain KCL and KVL. Calculate current I_L in the following circuit using Kirchoff's Laws.   5+5

EITHER

3. (A) What is meant by 'breakdown' in a PN junction diode ? State the different breakdown types and explain them. 5+5

OR

(B) Explain the concept of energy band. Define intrinsic and extrinsic semiconductor. Explain formation of P-N junction and its working in forward bias and reverse bias mode.

2+3+5

EITHER

4. (A) Explain working of n-p-n transistor. Explain the use of transistor as a switch. For a typical transistor, $\alpha = 0.975$ and IC = 6 mA. Calculate I_B and β. 1+3+3+3

OR

(B) Draw circuit configuration of CB, CE and CC mode for NPN transistor. Explain Voltage Divider biasing. 6+4

5. Solve any **TEN** :

(A) Draw the symbol for step-down transformer.

(B) Find equivalent capacitance of following network.
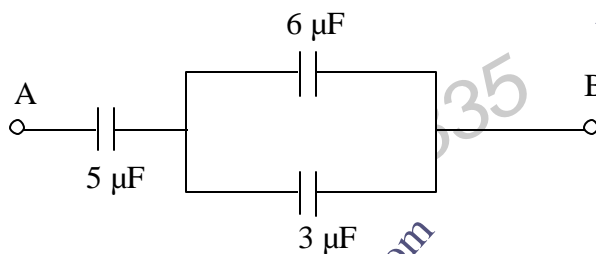
(C) What is the value of resistor with following colour code sequence ?

Red Brown Yellow Silver

(D) State KVL.

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

(F) State maximum power transfer theorem.

(G) Define depletion region.

(H) What is zener effect ?

(I) List any three trivalent elements.

(J) If $\alpha = 0.99$, find β.

(K) Draw circuit configuration for CB mode of npn transistor.

(L) What is biasing ? 10×1