

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

Q1. Attempt the following:-

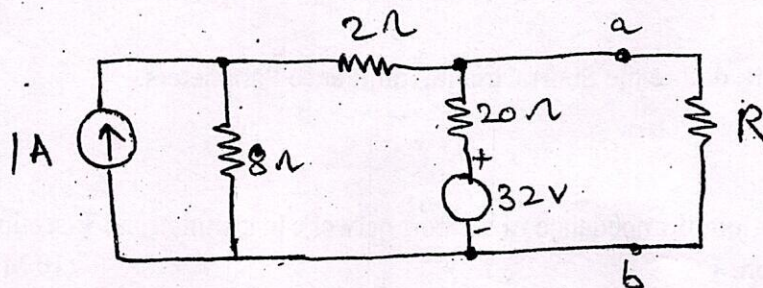
(10x1)

- If the current in one coil becomes steady, the current in neighboring coil will be \_\_\_\_\_.
- Star connection is also known as \_\_\_\_\_
- Batteries are generally connected in \_\_\_\_\_
- In a \_\_\_\_\_ circuit, the total resistance is greater than the largest resistance in the circuit
- What are the torque slip characteristics of an induction motor?
- The maximum power is delivered to a circuit when source resistance is \_\_\_\_\_ load resistance.
- What are poles and zeros of a network?
- What are poles of network function?
- What is meant by characteristic impedance?
- What are the advantages of M derived filters over constant k filters?

## Section- A

Q.2 a) For the circuit given, find the Thevenin voltage and Norton current using the principle of superposition.

(5 Marks)



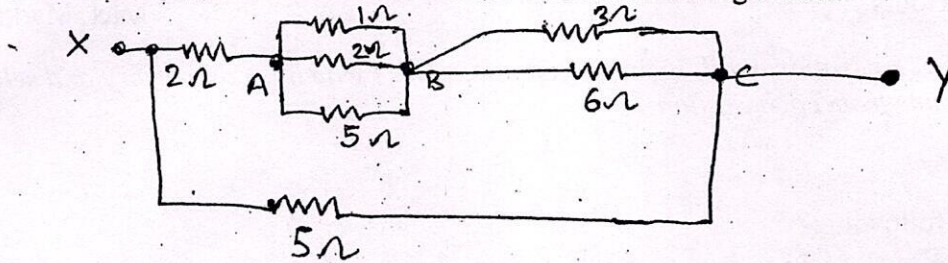
b) Explain factors that are responsible of choosing Nodal or Mesh Analysis for circuit? (5 Marks)

P.T.O.

(2)

Q.3

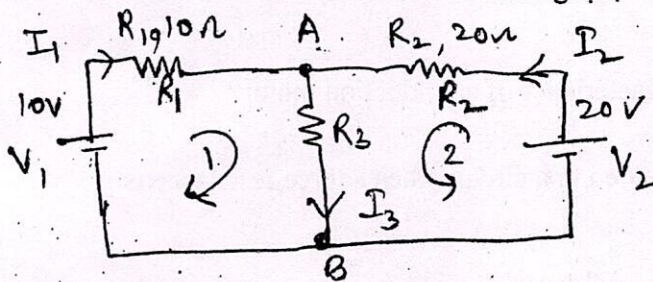
- a) Find the equivalent resistance across X-Y of the following circuit? (5 Marks)



- b) Explain dependent sources and Voltage Controlled Voltage Source (VCVS). (5 Marks)

Q.4

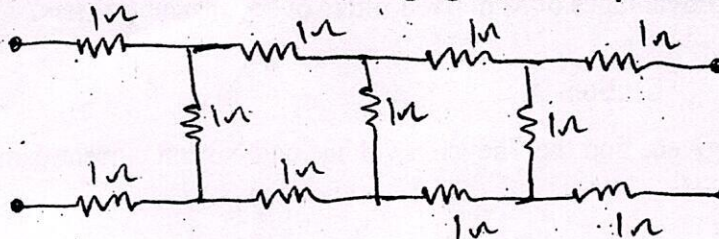
- a) For the circuit shown, find the current through  $R_1$  (5 Marks)



- b) What are the restrictions of poles and zeros in driving point functions? (5 Marks)

Section- B

- Q.5 a) For the network shown in the following figure, find the parameters  $z_{11}$  and  $z_{21}$ . (5Marks)



- b) For 2 port network define the Short Circuit Admittance Parameters. (5Marks)

Q.6

Draw the configuration of impedance of a 2 port network in symmetrical T-section and unbalanced  $\pi$  section. (10 Marks)

Q.7

- a) Define the principle behind single phase induction motor. (5 Marks)  
 b) Discuss various speed control methods in respect to electric motors (5 Marks)