

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

CLASS: BTECH
BRANCH: CS/IT/ECE/EEE

SEMESTER : II
SESSION : SP/2022

SUBJECT: EE101 BASICS OF ELECTRICAL ENGINEERING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

- Q.1(a) Distinguish between an ideal independent voltage source and a practical voltage source. What are the types of dependent sources? Explain with a diagram. [5]
- Q.1(b) Find the current i_o in the circuit in Fig. 1. [5]

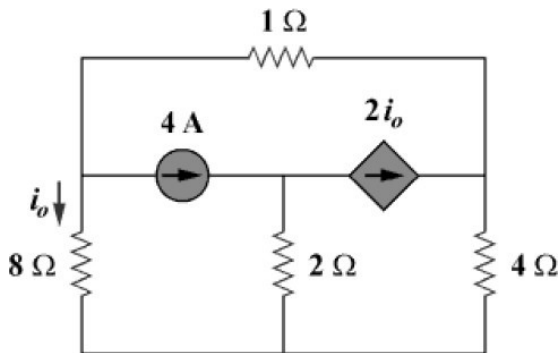


Fig. 1.

- Q.2(a) Define RMS value, average value, form factor and peak factor of a sine wave. What is a power triangle? [5]
- Q.2(b) Find the voltage V_x as shown in Fig.2. [5]

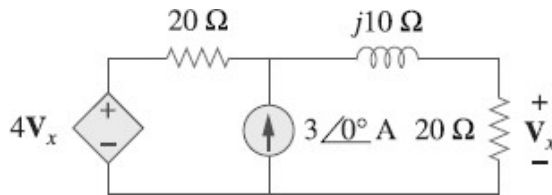


Fig. 2

- Q.3(a) What is positive phase sequence and negative phase sequence in a three-phase circuit? Obtain the relation between the line voltage and phase voltage in a three-phase star-connected circuit. [5]
- Q.3(b) Solve for the line currents in the Y- Δ circuit of Fig.3. Consider $Z_\Delta = 60 \angle 45^\circ \Omega$ [5]

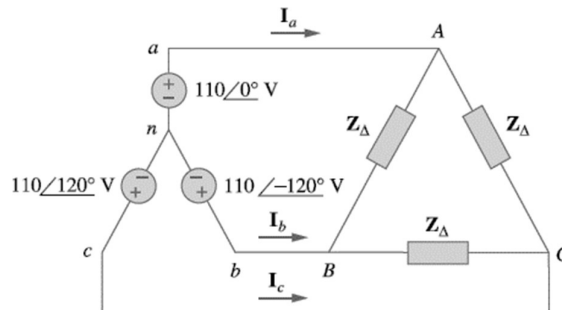


Fig.3

Q.4(a) State and explain superposition theorem. Describe its limitations. [5]

Q.4(b) Obtain the Thevenin equivalent at terminals a-b of the circuit in Fig.4. [5]

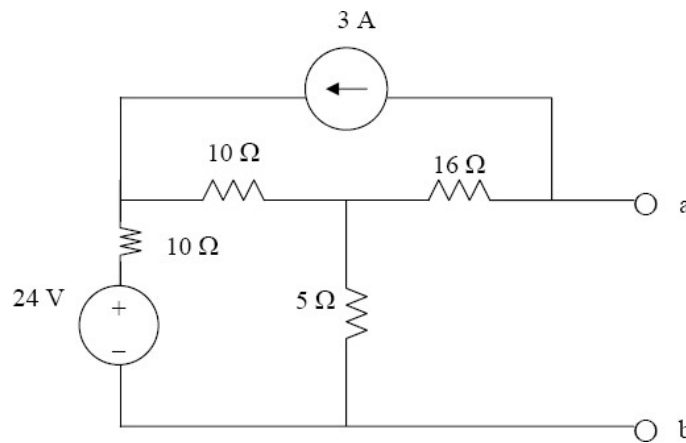


Fig.4

Q.5(a) Explain the working principle of an ac generator. [5]

Q.5(b) Write short notes on the working principle of a transformer. [5]

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