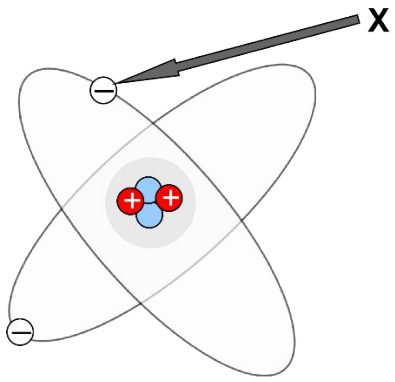
Question block created by wizard

This exam contains 52 questions.

$$F = \frac{k \cdot Q_1 \cdot Q_2}{d^2}$$
$$I = \frac{Q}{t}$$
$$R = \frac{U}{I}$$
$$R = \frac{1}{G}$$
$$\Sigma I_{in} = \Sigma I_{out}$$
$$\Sigma U = I \cdot \Sigma R$$
$$I_{tot} = I_1 + I_2 + I_3 + \ldots$$
$$I_{tot} = I_1 = I_2 = I_3 = \ldots$$
$$U_{tot} = U_1 + U_2 + U_3 + \ldots$$
$$U_{tot} = U_1 = U_2 = U_3 = \ldots$$
$$R_{tot} = R_1 + R_2 + R_3 + \ldots$$
$$R_{tot} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \ldots$$
$$X_{L(tot)} = X_{L1} + X_{L2} + X_{L3} + \ldots$$
$$\frac{1}{X_{L(tot)}} = \frac{1}{X_{L1}} + \frac{1}{X_{L2}} + \frac{1}{X_{L3}} + \ldots$$
$$X_{C(tot)} = X_{C1} + X_{C2} + X_{C3} + \ldots$$
$$\frac{1}{X_C} = \frac{1}{X_{C1}} + \frac{1}{X_{C2}} + \frac{1}{X_{C3}} + \ldots$$
$$U_{tot} = I \cdot R_{tot}$$
$$\rho = \frac{R \cdot A}{l}$$
$$P = U \cdot I$$
$$P = I^2 \cdot R$$
$$P = \frac{U^2}{R}$$
$$R_t = \frac{R}{n}$$
$$R_t = \frac{R_1 \cdot R_2}{R_1 + R_2}$$
$$R_1 \cdot R_4 = R_2 \cdot R_3$$
$$P = \frac{W}{t}$$
$$P_t = P_1 + P_2 + P_3 + \ldots$$
$$\eta = \frac{P_e}{P_t} C = \frac{\varepsilon \cdot A}{d}$$
$$C = \frac{Q}{U}$$
$$I = \frac{U}{R_t}$$
$$I = \frac{U - U_c}{R_t}$$
$$F_m = I \cdot n$$
$$H = \frac{I \cdot n}{l}$$
$$B = \frac{\Phi}{A}$$
$$\mu = \frac{B}{H}$$
$$E = -n \frac{d\Phi}{dt}$$
$$E = -L \frac{dI}{dt}$$
$$E = -M \frac{dI}{dt}$$
$$M = \sqrt{L_1 L_2}$$
$$M = k\alpha \sqrt{L_1 L_2}$$
$$L_{tot} = L_1 + L_2 + 2M$$
$$L_{tot} = L_1 + L_2 - 2M$$
$$f = \frac{1}{T}$$
$$U_{av} = 0{,}636 \cdot \hat{u}$$
$$U_{RMS} = \frac{\hat{u}}{\sqrt{2}}$$
$$U_L = U_r \cdot \sqrt{3}$$
$$I_L = I_r \cdot \sqrt{3}$$
$$U_L = U_r$$
$$X_L = 2\pi f L$$
$$X_C = \frac{1}{2\pi f C}$$
$$Z = \frac{U}{I}$$
$$Z = \sqrt{R^2 + X_L^2}$$
$$f_0 = \frac{1}{2\pi \sqrt{LC}}$$
$$U_2 = N_2 \frac{d\Phi}{dt}$$
$$N_p \cdot I_p = N_s \cdot I_s$$
$$\frac{U_s}{U_p} = \frac{N_s}{N_p}$$
$$f = \frac{P \cdot n}{60}$$
$$s = \frac{n_s - n_r}{n_s}$$
$$n = \frac{60 \cdot f}{P} - s$$

1. What is the name of the subatomic particle indicated by X?



a. Neutron
b. Electron
c. Proton

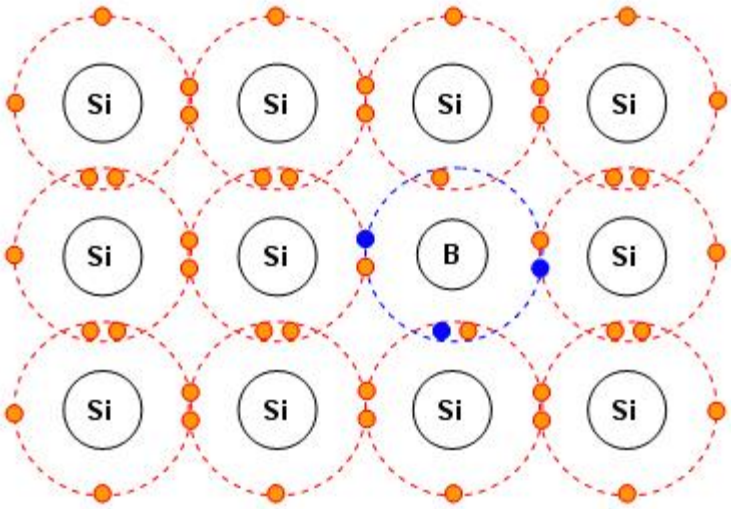
2. Give the names of the charged particles of an atom.

a. Neutrons and electrons
b. Protons and electrons
c. Protons and neutrons

3. What is intrinsic material

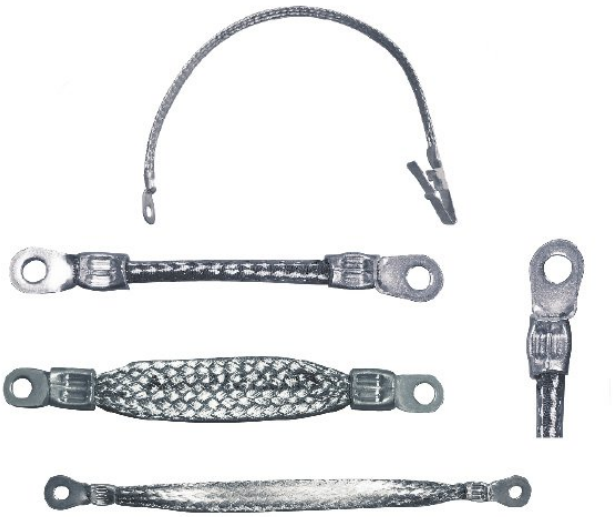
a. A conductor
b. An insulator
c. A semiconductor

4. To what kind of material belongs this crystal lattice?



a. Intrinsic silicon
b. N silicon
c. P silicon

5. What are the items shown in the figure used for?

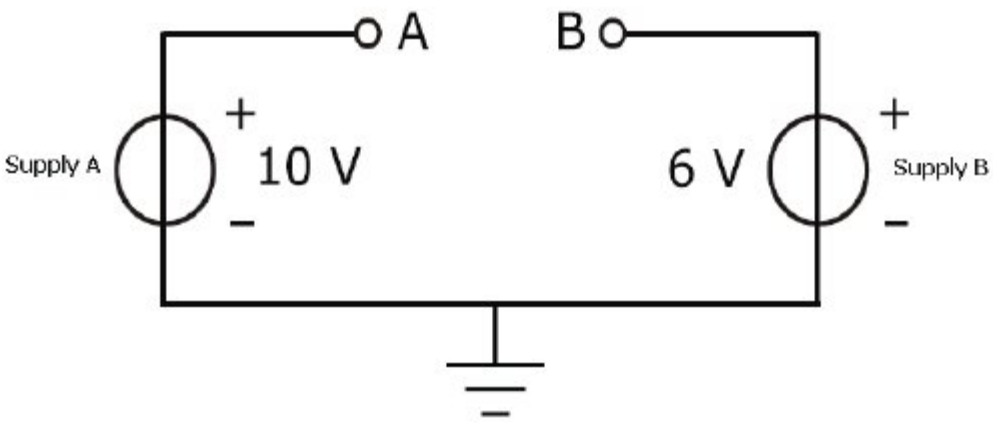


a. To connect 2 movable components together.
b. To isolate two structural parts.
c. To bond two structural parts electrically.

6. What medium is used in a cathode ray tube for its operation?

a. Solid
b. Vacuum
c. Gas

7. What is the potential difference at U_{AB} in the next figure?



a. -4 Volt
b. 4 Volt
c. 16 Volt

8. Conductance is:

a. expressed in Ohms.
b. the sum of all resistances in a circuit.
c. the inverse of resistance.

9. A voltage, generated by magnetism is....

a. an AC voltage
b. a DC voltage
c. a combination of AC and DC voltage

10. If a voltage is generated by piezoelectric effect this voltage is generated by....

a. friction
b. heat
c. pressure

11. Voltage produced by sunlight is called....

a. piezoelectric effect
b. thermo-energy
c. photovoltaic conversion

12. A primary cell is....

a. Not Rechargeable
b. Rechargeable
c. always a dry cell

13. What is the effect of hydrogen bubbles forming on the surface of the cathode?

The cell....

a. discharges more quickly.
b. output voltage decreases.
c. heats up.

14. Which of the following photo-cells are also called solar cells?

a. Photo-emitting cells.
b. Photo-voltaic cells.
c. Photo-conducting cells.

15. Ohm's law shows a relationship between;

a. Current, voltage and resistance.
b. Voltage and resistance only.
c. Current and resistance only.

16. For a given circuit, the circuit current is 2 ampere. The load resistance is 6 Ohm. The supply voltage is;

a. 3 Volt
b. 12 Volt
c. $^{1}/_{3}$ Volt

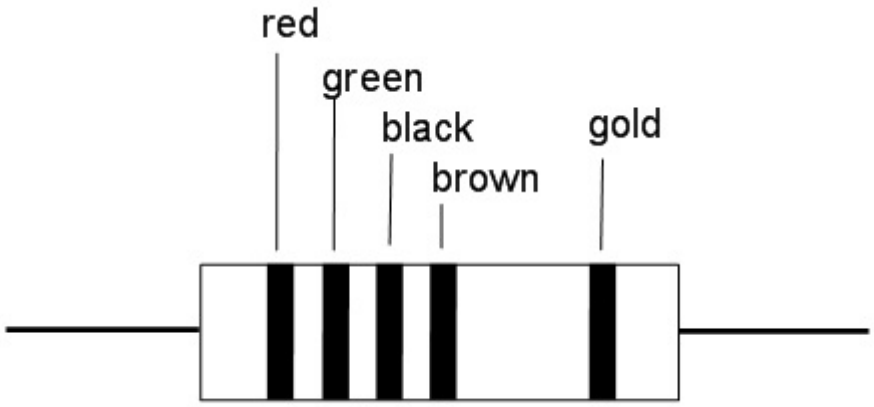
17. The EMF of a voltage source is 10 V. The internal resistance of this source is 1 Ω. A load resistance is connected to the terminals.

What happens with the terminal voltage if the load resistance increases?

The terminal voltage will...

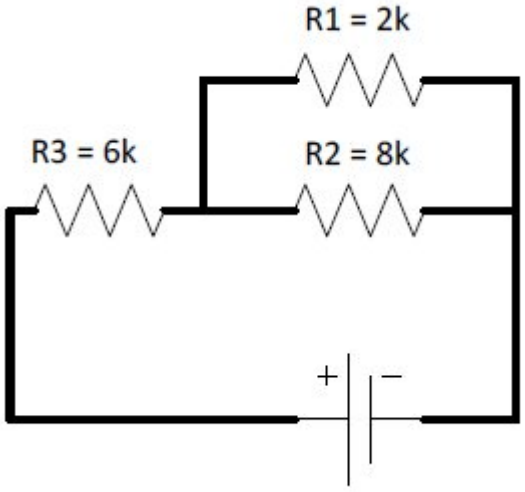
a. increase.
b. decrease.
c. not change.

18. What is the value of the resistor?



a. 25200 Ω.
b. 2k5 Ω.
c. 252 Ω.

19. What is the total resistance of this circuit?



a. 16 kΩ.
b. $6\,^{5}/_{8}$ kΩ.
c. 7,6 kΩ.

20. Calculate the maximum current in a 2 Ω ; 8 Watt resistor.

a. 16 A.
b. 2 A.
c. 4 A.

21. The resistance of a Voltage Dependent Resistor (VDR)....

a. Varies only with a temperature change.
b. Increase when the applied voltage decreases.
c. Increases when the applied voltage increases.

22. An electrolytic rheostat is a rheostat with....

a. metal wire as an resistor.
b. carbon layer as resistor.
c. conductive fluid as resistor.

23. High current conductors are not bundled together with other wires because....

a. power and signal wires can be routed together.
b. of too much weight.
c. of danger to overheating.

24. Energy is....

a. the power consumption during an amount of time.
b. when power is transformed into movement.
c. the same as power.

25. A 14 Ohm resistor is connected parallel to a 56 Ohm resistor. Calculate the Resistance of the circuit?

a. 0,09 Ω
b. 11 Ω
c. 784 Ω

26. What happens with the capacitance of a capacitor if the plate area increases?

The capacitance....

a. will decrease.
b. will increase.
c. will not change.

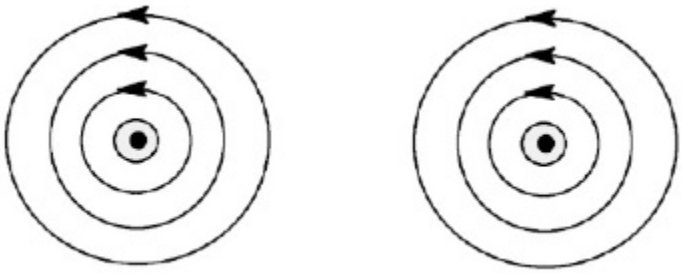
27. Which kinds of electrolytic capacitors are in use?

a. Dry electrolytic.
b. Wet electrolytic.
c. Wet electrolytic and dry electrolytic.

28. The charging and discharging current by a Capacitor is....

a. not in the same direction.
b. in the same direction.
c. not possible to calculate.

29. Consider two parallel wires conducting a current according the picture. What will happen with those two wires?



The wires will...

a. not influence each other.
b. attract each other.
c. repel each other

30. The earth magnetic poles are....

a. the geographical poles and the earth magnetic poles are the same.
b. located at the geographic poles.
c. not located at the geographical poles.

31. Permanent magnets are used in....

a. devices with big and low power.
b. devices with big power.
c. devices with low power.

32. Ferromagnetic materials are....

a. magnetized easily.

b. never magnetized.
c. permanent strong magnetized.

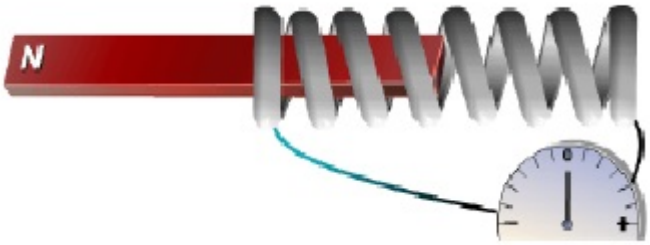
33. What is coercivity?

a. All the magnetic domains are aligned and an additional increase of magnetizing force will produce very little increase in magnetic flux.
b. The force required to remove the residual magnetism from the material.
c. The magnetic flux density that remains in a material when the magnetizing force is zero.

34. What are precautions for care and storage of magnets?

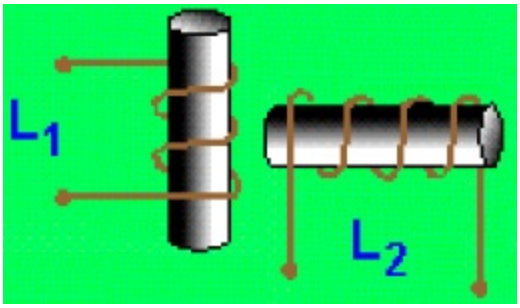
a. Magnets should be kept away from sensitive electronic equipment.
b. Magnets should be kept away from non-sensitive electronic equipment
c. Not existing.

35. A coil is connected to a galvanometer (see picture). What will happen with the needle of the galvanometer if the magnet does not move relative to the coil.?



a. The needle will not deflect.
b. There is not enough information to make a prediction of the movement of the needle.
c. The needle will deflect.

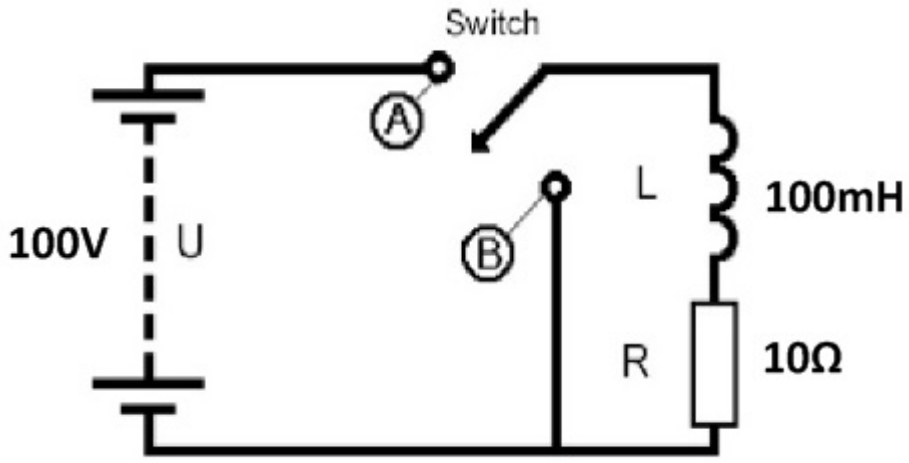
36. How large is the mutual inductance between these two coils?



The mutual inductance is....

a. zero.
b. large.
c. small.

37. Estimate the current in this circuit 100 ms after moving the switch into position A.



a. 6,3 A.
b. 0A.
c. 10 A.

38. What affects the output polarity of a DC generator?

a. The strength of the magnetic field.
b. The direction of the magnetic lines of flux.
c. The angle which the conductor cuts the magnetic field.

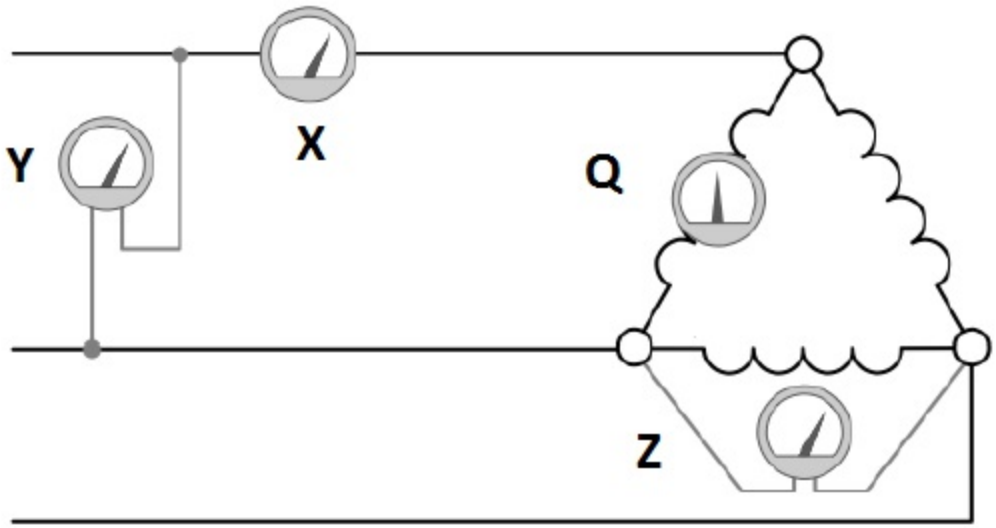
39. What is the correct way of connecting inter-poles in a generator?

a. In series with the field windings.
b. Parallel with the armature.
c. In series with the armature.

40. The term "frequency" indicates the number of complete wave cycles per....

a. second.
b. minute.
c. hour.

41. Which meter indicates the phase current?



a. Meter X.
b. Meter Q.
c. Meter Z.

42. An inductive load will cause the current to....

a. remain in phase with the voltage.
b. lag the applied voltage by 90 degrees
c. lead the applied voltage by 90 degrees.

43. What is impedance?

a. The opposition to voltage in an AC circuit.
b. The opposition to current flow in a AC circuit.
c. The opposition to current flow in a DC circuit.

44. The sides of all current transformers are marked "H1" and "H2" on the unit base. The transformers must be installed with the "H1" side...

a. toward the generator in the circuit in order to have proper load.
b. backward the generator in the circuit in order to have proper polarity.
c. toward the generator in the circuit in order to have proper polarity.

45. The secondary power of a three phase transformer, without losses, connected in a Y is 300 W.

Calculate the primary current if the primary phase voltage equals to 10 V.

a. 10 A
b. $^{10}/_{\sqrt{3}}$ A
c. 30 A

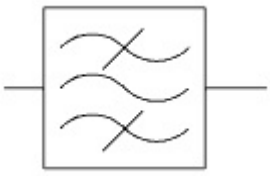
46. A transformer has a ratio from 1 to 100. A current flow 10A in the primary lead. The secondary current will be?

a. 100 A
b. 0,1 A
c. 1000 A

47. What is the "cut-off frequency" of a HP filter?

a. The frequency at which the filter starts to filter.
b. The frequency at which the filter will destroy itself.
c. The frequency at which the filter stops working.

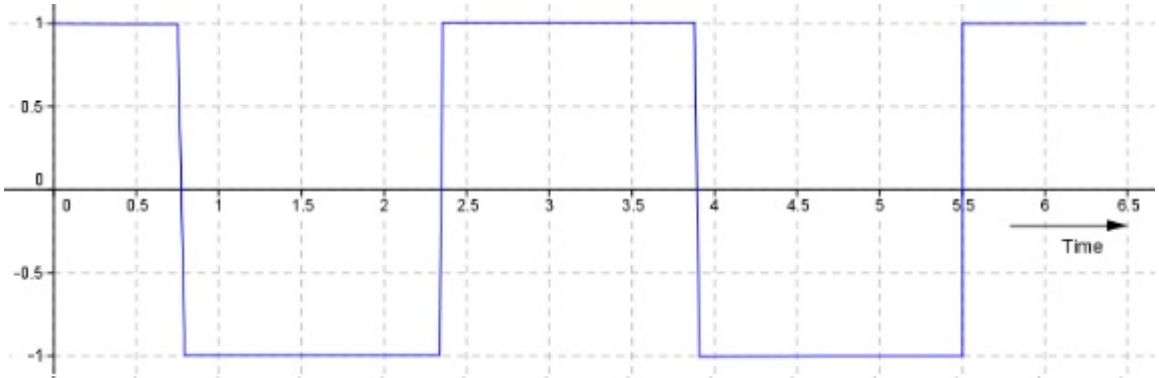
48. This is the symbol of a....



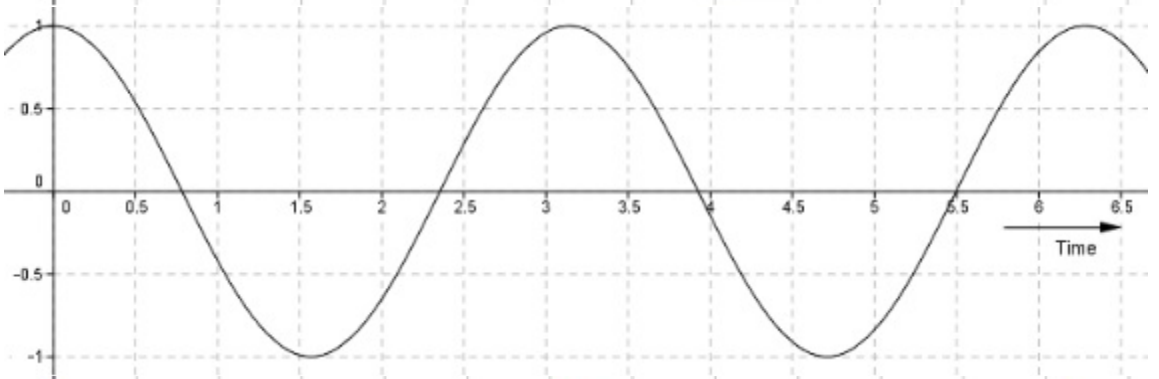
a. Band Pass Filter
b. Low Pass Filter
c. Band Stop Filter

49. When an AC Generator is producing alternating current, what is the shape of the waveform?

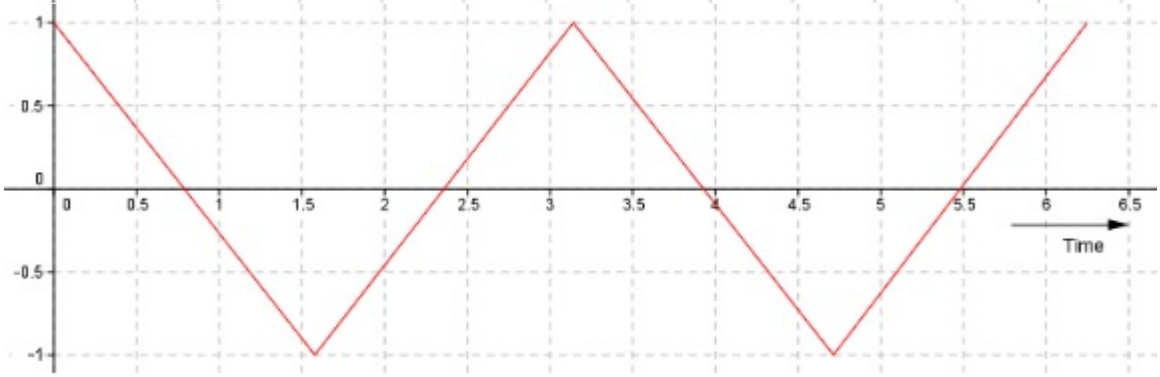
a.



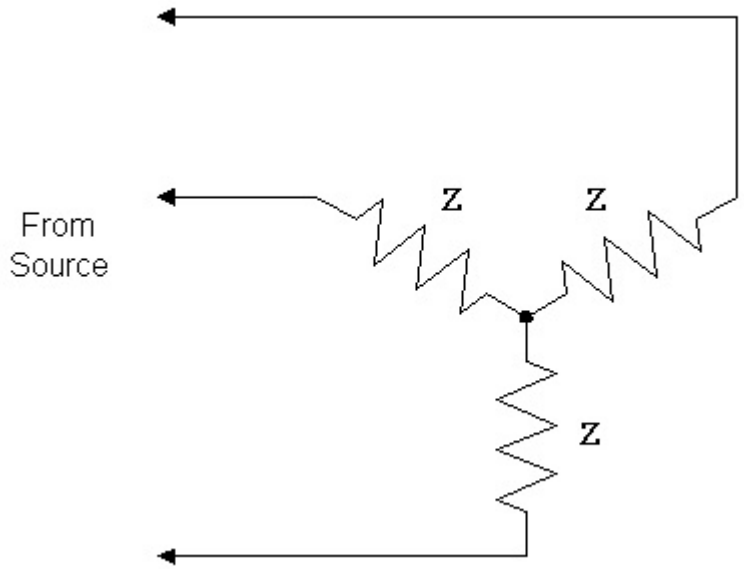
b.



c.



50. What kind of three phase connection is indicated?



a. Wye Connection
b. Delta Connection
c. X-Ray Connection

51. In a split phase motor....

a. the starting winding is placed on the main or running winding.
b. the starting winding is 180 electrical degrees displaced from the main or running winding.
c. the starting winding is 90 electrical degrees displaced from the main or running winding.

52. What happens if an induction motor has no slip?

a. The rotor would slow down.
b. High current flow in the rotor.
c. Nothing, the motor is still running.