Question block created by wizard

This exam contains 52 questions.

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

1. What is the electrical charge of an electron?

- o (a) Positive
- o (b) Neutral
- • (c) Negative

If choice c is selected set score to 1.

2. What is the name of an atom which has less than its normal amount of electrons?

- o (a) A negative ion
- • (b) A positive ion

- (c) An atom

If choice b is selected set score to 1.

3. What determines the valence of an atom?

- (a) The number of electrons
- (b) The number of shells of an atom

- (c) The number of electrons in the outer most shell

If choice c is selected set score to 1.

4. What is mica?

- (a) An insulator

- (b) A conductor
- (c) A semi-conductor

If choice a is selected set score to 1.

5. What does it mean when two points are "bonded"?

- (a) They are electrically isolated.

- (b) They have a good electrical connection.

- (c) They are glued together.

If choice b is selected set score to 1.

6. A liquid conducts by means of freely moving...

- (a) electrons and negative ions.

- (b) positive and negative ions.

- (c) electrons.

If choice b is selected set score to 1.

7. How is a voltmeter connected to measure a voltage?

- (a) In series with the load through which the current flows.
- (b) In series with the device of which the voltage has to be measured.

- (c) Connected between the two points of which the voltage has to be measured.

If choice c is selected set score to 1.

8. During 2 minutes a charge of 120 Coulomb is passed through the conductor. What is the current in the conductor ?

- o (a) 240 A
- • (b) 1 A
- o (c) 60 A

If choice b is selected set score to 1.

9. Static electricity is produced by

- o (a) Heat.
- • (b) Friction.
- o (c) Pressure.

If choice b is selected set score to 1.

10. The piezoelectric effect is used for....

- o (a) light measurement
- o (b) temperature measurement
- • (c) generating high voltage

If choice c is selected set score to 1.

11. Solar cells are made of....

- o (a) electrolyte
- o (b) rochelle salts
- • (c) semiconductor material

If choice c is selected set score to 1.

12. Electrolyte is used in a....

- o (a) piezo crystal
- • (b) battery
- o (c) thermocouple

If choice b is selected set score to 1.

13. In which type of cell does chemical action eat away the electrode?

- o (a) Secondary cell.
- o (b) Lead-Acid cell.
- • (c) Primary cell.

If choice c is selected set score to 1.

14. When connecting cells in series, what happens to the total output?

- o (a) The total voltage and overall capacity increases.
- • (b) The total voltage increases while the overall capacity remains the same.
- o (c) The overall capacity increases while the total voltage remains the same.

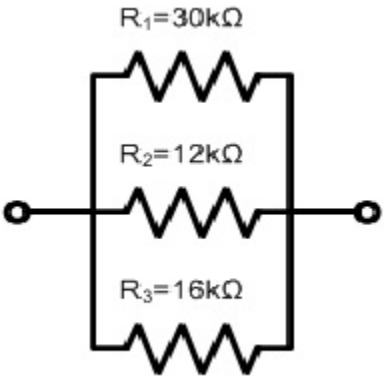
If choice b is selected set score to 1.

15. When the resistance in a circuit is decreased under a constant supply voltage, the current will....

- • (a) increase.
- o (b) be constant.
- o (c) decrease.

If choice a is selected set score to 1.

16. In which resistor is the current flow the lowest?



- o (a) R_3
- o (b) R_2
- • (c) R_1

If choice c is selected set score to 1.

17. The EMF of a voltage source is 12 V. The internal resistance is 2 Ω. The load resistance is 4 Ω.

Calculate the terminal voltage.

- o (a) 12 V
- o (b) 4 V
- • (c) 8 V

If choice c is selected set score to 1.

18. The resistance of a wire is;

- • (a) Inverse proportional to the wire cross sectional area.
- o (b) Inverse proportional to the wire length.
- o (c) Proportional to the wire cross sectional area.

If choice a is selected set score to 1.

19. When resistors are connected in series, the current in that circuit depends on?

- • (a) The sum of the resistor values and the supply voltage.
- o (b) The difference between the highest and lowest resistor value.
- o (c) The flow direction of the current in that circuit.

If choice a is selected set score to 1.

20. Calculate the maximum voltage across a 3 Ω ; 3 Watt resistor.

- o (a) 1 V.
- • (b) 3 V.
- o (c) 9 V.

If choice b is selected set score to 1.

21. What means a negative temperature coefficient (α) for a material?

- • (a) The resistance decreases with an increase of temperature.
- o (b) The change of resistance is only effective at temperatures below zero.
- o (c) The resistance increases with an increase of temperature.

If choice a is selected set score to 1.

22. A multi-turn potentiometer is normally used for....

- o (a) high frequencies.

- (b) high voltages.

- (c) accurate adjustments.

If choice c is selected set score to 1.

23. Electric power is....

- (a) the same as electric energy.
- (b) proportional to electric energy and time.

- (c) proportional to electric energy and inverse proportional to time.

If choice c is selected set score to 1.

24. The power in an electric circuit depends on....

- (a) the applied voltage and the time the applied voltage is switched on.
- (b) the total current and the duration of that current.

- (c) the applied voltage and the total current.

If choice c is selected set score to 1.

25. A flap motor is supplied with 28 V DC. The current is 10 amp. Calculate the power consumption.

- (a) 2.8 W

- (b) 280 W

- (c) 18 W

If choice b is selected set score to 1.

26. What is the Unit of capacitance?

- (a) Farad (F)

- (b) Henry (H)
- (c) Ohm (Ω)

If choice a is selected set score to 1.

27. A capacitor of n47 can be labelled as....

- (a) 0.47 nF

- (b) 0.47 mF
- (c) 4.7 nF

If choice a is selected set score to 1.

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

- o (a) in the same direction.
- • (b) not in the same direction.
- o (c) not possible to calculate.

If choice b is selected set score to 1.

29. To make permanent magnets....

- • (a) magnetically hard material is used.
- o (b) magnetically soft material is used.
- o (c) any magnetically material is used.

If choice a is selected set score to 1.

30. An aircraft magnetic compass has....

- o (a) one compensation screw marked N-S compensation.
- o (b) two compensation screws marked N-E and S-W compensation.
- • (c) two compensation screws, marked N-S and E-W compensation.

If choice c is selected set score to 1.

31. The strength of the magnetic field of an electromagnet can be increased by....

- o (a) decreasing the current flow and increasing the number of windings.
- • (b) increasing the current flow, or increasing the number of windings.
- o (c) increasing the current flow and decreasing the number of windings.

If choice b is selected set score to 1.

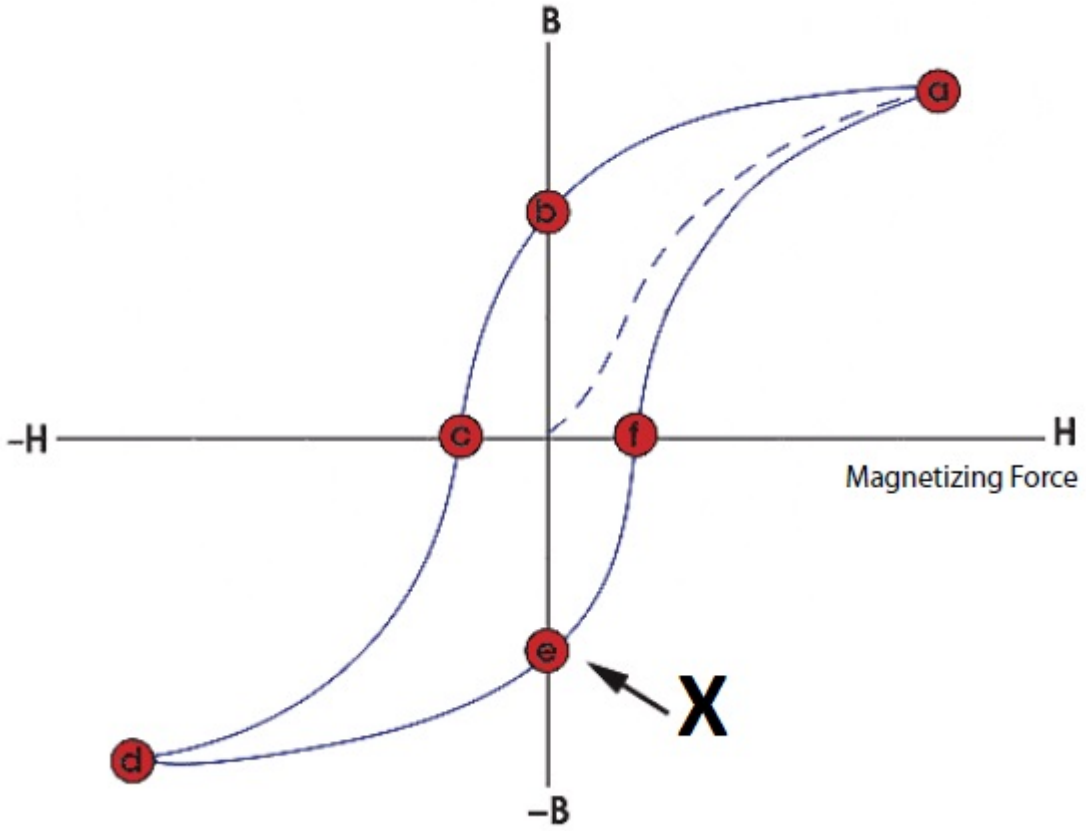
32. What happens with the flux density if the surface area of a magnet increases?

The flux density...

- • (a) will decrease.
- o (b) will not change.
- o (c) will increase.

If choice a is selected set score to 1.

33. What is the name of the point marked with an X in this graph?



- o (a) Coercivity point.
- o (b) Saturation point.

- (c) Retentivity point.

If choice c is selected set score to 1.

34. Shock, Stress and Vibration has...

- (a) influence on permanent magnets.

- o (b) no influence on magnet materials.
- o (c) almost none influence on magnet materials.

If choice a is selected set score to 1.

35. How is an EMF induced in a coil?

- (a) By relative motion between coil and magnet.

- o (b) Place the coil and magnet close to each other.
- o (c) Moving two magnets to each other.

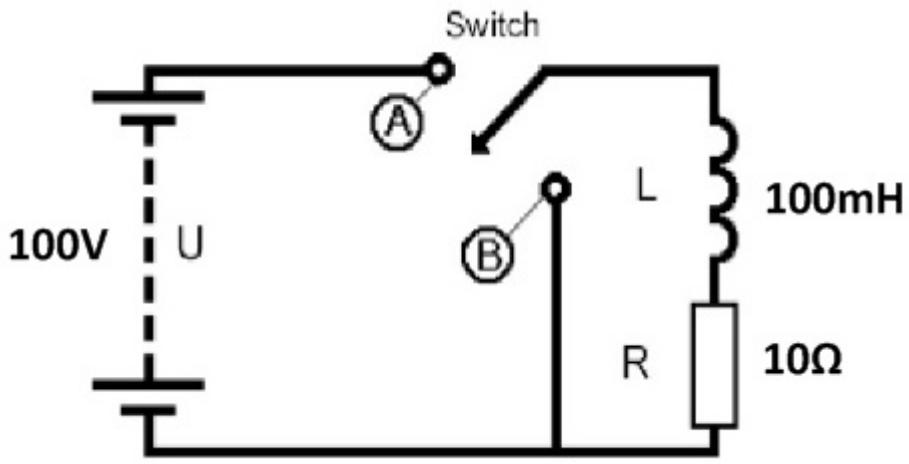
If choice a is selected set score to 1.

36. How can the self-induced voltage in a coil be increased? By....

- o (a) using a DC voltage instead of an AC voltage.
- • (b) increasing the number of turns of the coil.
- o (c) removing the iron core out of the coil.

If choice b is selected set score to 1.

37. Calculate the time constant of this circuit.



- o (a) 0,1 ms.
- • (b) 10 ms.
- o (c) 1000 ms.

If choice b is selected set score to 1.

38. What affects the magnitude of force in a DC motor?

- o (a) The direction of the magnetic field.
- • (b) The magnitude of the current flow in the armature.
- o (c) The total length of the conductor.

If choice b is selected set score to 1.

39. What happens with the magnetic neutral axis of a DC motor due to the armature reaction?

The magnetic neutral axis...

o (a) will move in the rotation direction.
o (b) will not move.

- (c) will move against the rotation direction.

If choice c is selected set score to 1.

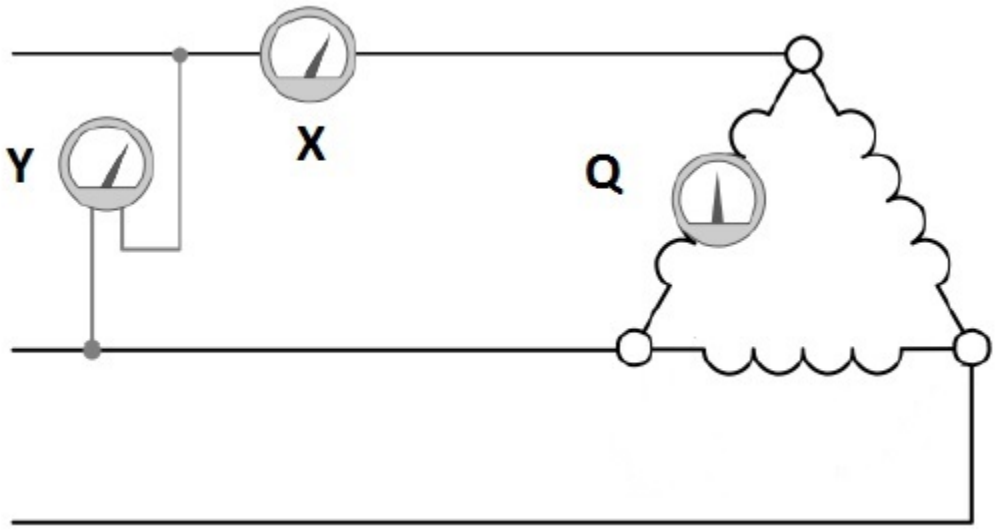
40. An AC signal has a period of 2 seconds. Calculate the frequency of this signal.

- (a) 0,5 Hz.

o (b) 2 Hz.
o (c) 4 Hz.

If choice a is selected set score to 1.

41. Which meter indicates the line voltage?



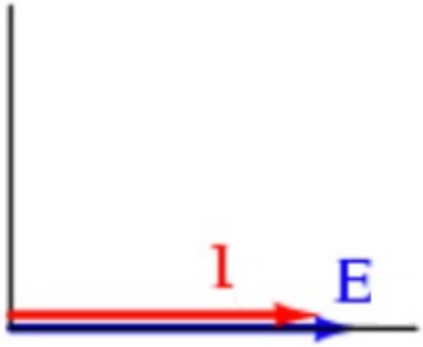
o (a) Meter Q.

- (b) Meter Y.

o (c) Meter X.

If choice b is selected set score to 1.

42. To which circuit, connected on a sine wave AC source belongs this phasor diagram?



- o (a) Capacitor
- • (b) Resistor
- o (c) Inductor

If choice b is selected set score to 1.

43. In which type of circuit is the power always positive?

- • (a) A resistive circuit.
- o (b) A capacitive circuit.
- o (c) An inductive circuit.

If choice a is selected set score to 1.

44. The current transformer is a....

- o (a) dual wire magnetic transformer.
- o (b) ring dual-type transformer.
- • (c) ring-type transformer.

If choice c is selected set score to 1.

45. The primary line current of a three phase transformer, without losses, connected in a Y is $^{10}/_{\sqrt{3}}$ A.

Calculate the secondary power if the primary phase voltage equals to 10V.

- • (a) $^{300}/_{\sqrt{3}}$ W
- o (b) 300 W
- o (c) 100 W

If choice a is selected set score to 1.

46. A step-up transformer has a 1 to 4 turns ratio....

- o (a) 8 turns primary and 2 turns secondary.
- • (b) 2 turns primary and 8 turns secondary.
- o (c) 2 turns primary and 4 turns secondary.

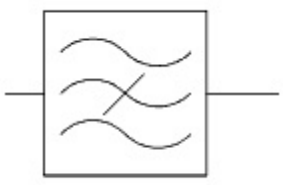
If choice b is selected set score to 1.

47. What type of filter is commonly used in microphone circuits?

- • (a) High pass filter.
- o (b) Band pass filter.
- o (c) Band stop filter.

If choice a is selected set score to 1.

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



- o (a) Band Pass Filter
- o (b) High Pass Filter
- • (c) Band Stop Filter

If choice c is selected set score to 1.

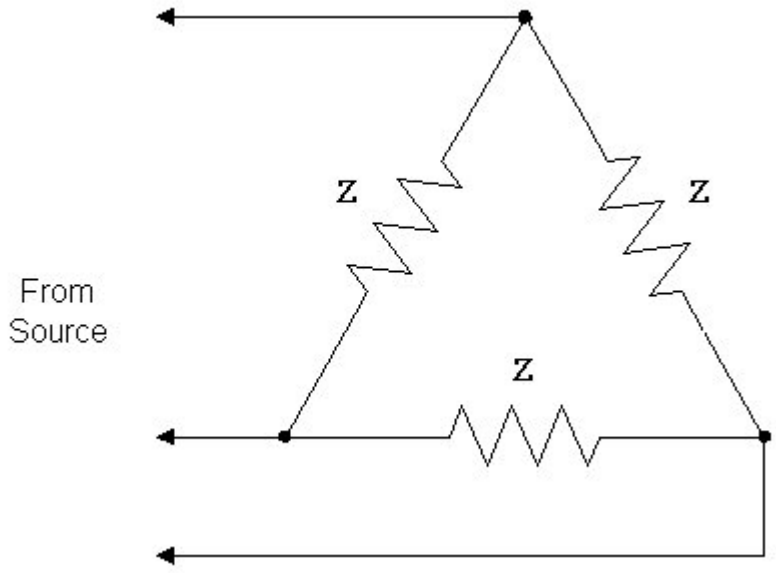
49. The rotation speed of the armature of an AC generator increase.

What happens with the output frequency of this generator? The frequency...

- • (a) will increase.
- o (b) will not change.
- o (c) will decrease.

If choice a is selected set score to 1.

50. What kind of three phase connection is indicated?



- o (a) Wye Connection
- o (b) Star Connection
- • (c) Delta Connection

If choice c is selected set score to 1.

51. On a split phase motor, a centrifugal switch disconnects the starting winding automatically, after the rotor has attained approximately....

- • (a) 25 percent of its rated speed.
- o (b) 90 percent of its rated speed.
- o (c) 75 percent of its rated speed.

If choice a is selected set score to 1.

52. How can we change the direction of rotation of a two phase motor?

By reversing...

- o (a) the connections to the starting winding.
- • (b) the connection of one phase.
- o (c) two of the leads to supply the motor.

If choice b is selected set score to 1.

If assessment score is 75% to 100% Pass
If assessment score is 0% to 74% Fail