Question block created by wizard

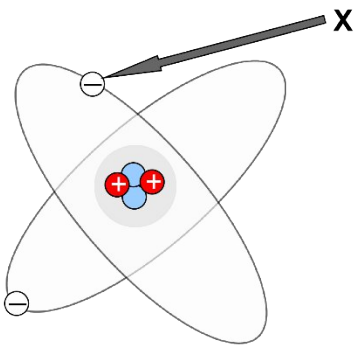
This exam contains 52 questions.

$$F = \frac{k \cdot Q_1 \cdot Q_2}{d^2}$$
$$I = \frac{Q}{t}$$
$$R = \frac{U}{I}$$
$$R = \frac{1}{G}$$
$$\Sigma I_{in} = \Sigma I_{out}$$
$$\Sigma U = I \cdot \Sigma R$$
$$I_{tot} = I_1 + I_2 + I_3 + \ldots$$
$$I_{tot} = I_1 = I_2 = I_3 = \ldots$$
$$U_{tot} = U_1 + U_2 + U_3 + \ldots$$
$$U_{tot} = U_1 = U_2 = U_3 = \ldots$$
$$R_{tot} = R_1 + R_2 + R_3 + \ldots$$
$$R_{tot} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \ldots$$
$$X_{L(tot)} = X_{L1} + X_{L2} + X_{L3} + \ldots$$
$$\frac{1}{X_{L(tot)}} = \frac{1}{X_{L1}} + \frac{1}{X_{L2}} + \frac{1}{X_{L3}} + \ldots$$
$$X_{C(tot)} = X_{C1} + X_{C2} + X_{C3} + \ldots$$
$$\frac{1}{X_C} = \frac{1}{X_{C1}} + \frac{1}{X_{C2}} + \frac{1}{X_{C3}} + \ldots$$
$$U_{tot} = I \cdot R_{tot}$$
$$\rho = \frac{R \cdot A}{l}$$
$$P = U \cdot I$$
$$P = I^2 \cdot R$$
$$P = \frac{U^2}{R}$$

$$R_t = \frac{R}{n}$$
$$R_t = \frac{R_1 \cdot R_2}{R_1 + R_2}$$
$$R_1 \cdot R_4 = R_2 \cdot R_3$$
$$P = \frac{W}{t}$$
$$P_t = P_1 + P_2 + P_3 + \ldots$$
$$\eta = \frac{P_e}{P_t} C = \frac{\varepsilon \cdot A}{d}$$
$$C = \frac{Q}{U}$$
$$I = \frac{U}{R_t}$$
$$I = \frac{U - U_c}{R_t}$$
$$F_m = I \cdot n$$
$$H = \frac{I \cdot n}{l}$$
$$B = \frac{\Phi}{A}$$
$$\mu = \frac{B}{H}$$
$$E = -n \frac{d\Phi}{dt}$$
$$E = -L \frac{dI}{dt}$$
$$E = -M \frac{dI}{dt}$$
$$M = \sqrt{L_1 L_2}$$
$$M = k\alpha \sqrt{L_1 L_2}$$

$$L_{tot} = L_1 + L_2 + 2M$$
$$L_{tot} = L_1 + L_2 - 2M$$
$$f = \frac{1}{T}$$
$$U_{av} = 0{,}636 \cdot \hat{u}$$
$$U_{RMS} = \frac{\hat{u}}{\sqrt{2}}$$
$$U_L = U_f \cdot \sqrt{3}$$
$$I_L = I_f \cdot \sqrt{3}$$
$$U_L = U_f$$
$$X_L = 2\pi f L$$
$$X_C = \frac{1}{2\pi f C}$$
$$Z = \frac{U}{I}$$
$$Z = \sqrt{R^2 + X_L^2}$$
$$f_0 = \frac{1}{2\pi \sqrt{LC}}$$
$$U_2 = N_2 \frac{d\Phi}{dt}$$
$$N_p \cdot I_p = N_s \cdot I_s$$
$$\frac{U_s}{U_p} = \frac{N_s}{N_p}$$
$$f = \frac{P \cdot n}{60}$$
$$s = \frac{n_s - n_r}{n_s}$$
$$n = \frac{60 \cdot f}{P} - s$$

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



- (a) Neutron
- (b) Electron
- (c) Proton

If choice b is selected set score to 1.

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

- (a) Neutrons and electrons
- (b) Protons and electrons
- (c) Protons and neutrons

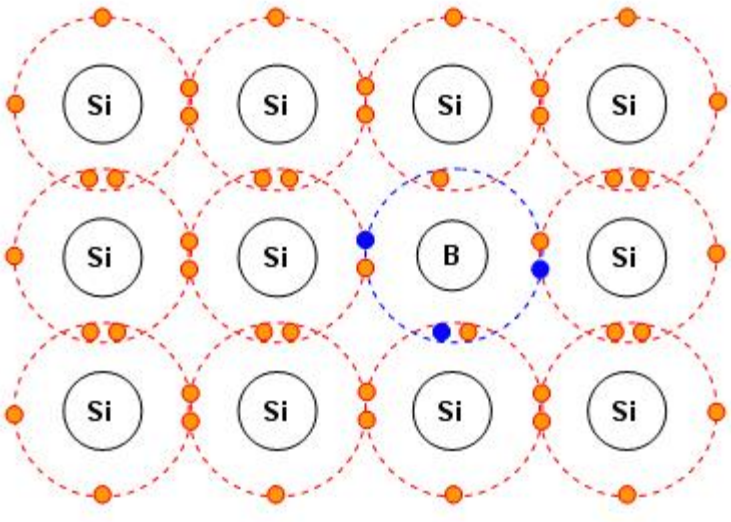
If choice b is selected set score to 1.

3. What is intrinsic material

- (a) A conductor
- (b) An insulator
- (c) A semiconductor

If choice c is selected set score to 1.

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



- (a) Intrinsic silicon
- (b) N silicon
- (c) P silicon

If choice c is selected set score to 1.

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

- o (a) To connect 2 movable components together.
- o (b) To isolate two structural parts.
- • (c) To bond two structural parts electrically.

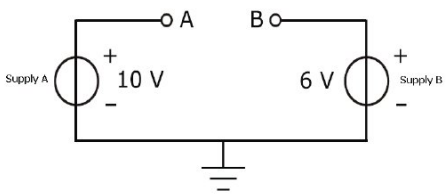
If choice c is selected set score to 1.

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

- o (a) Solid
- • (b) Vacuum
- o (c) Gas

If choice b is selected set score to 1.

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



- o (a) -4 Volt

- (b) 4 Volt

o (c) 16 Volt

If choice b is selected set score to 1.

8. Conductance is:

o (a) expressed in Ohms.
o (b) the sum of all resistances in a circuit.

- (c) the inverse of resistance.

If choice c is selected set score to 1.

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

- (a) an AC voltage

o (b) a DC voltage
o (c) a combination of AC and DC voltage

If choice a is selected set score to 1.

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

o (a) friction
o (b) heat

- (c) pressure

If choice c is selected set score to 1.

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

o (a) piezoelectric effect
o (b) thermo-energy

- (c) photovoltaic conversion

If choice c is selected set score to 1.

12. A primary cell is....

- (a) Not Rechargeable

o (b) Rechargeable
o (c) always a dry cell

If choice a is selected set score to 1.

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

The cell....

o (a) discharges more quickly.

• (b) output voltage decreases.

o (c) heats up.

If choice b is selected set score to 1.

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

o (a) Photo-emitting cells.

• (b) Photo-voltaic cells.

o (c) Photo-conducting cells.

If choice b is selected set score to 1.

15. Ohm's law shows a relationship between;

• (a) Current, voltage and resistance.

o (b) Voltage and resistance only.
o (c) Current and resistance only.

If choice a is selected set score to 1.

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

o (a) 3 Volt

• (b) 12 Volt

o (c) $^1/_3$ Volt

If choice b is selected set score to 1.

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?

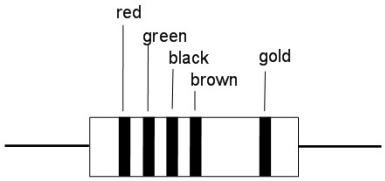
The terminal voltage will...

• (a) increase.

o (b) decrease.
o (c) not change.

If choice a is selected set score to 1.

18. What is the value of the resistor?



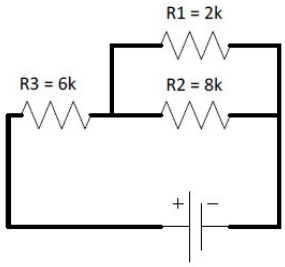
o (a) 25200 Ω.

• (b) 2k5 Ω.

o (c) 252 Ω.

If choice b is selected set score to 1.

19. What is the total resistance of this circuit?



o (a) 16 kΩ.
o (b) 6 $^{5}/_{8}$ kΩ.

• (c) 7,6 kΩ.

If choice c is selected set score to 1.

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

o (a) 16 A.

• (b) 2 A.

o (c) 4 A.

If choice b is selected set score to 1.

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

- o (a) Varies only with a temperature change.
- o (b) Increase when the applied voltage decreases.
- • (c) Increases when the applied voltage increases.

If choice c is selected set score to 1.

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

- o (a) metal wire as an resistor.
- o (b) carbon layer as resistor.
- • (c) conductive fluid as resistor.

If choice c is selected set score to 1.

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

- o (a) power and signal wires can be routed together.
- o (b) of too much weight.
- • (c) of danger to overheating.

If choice c is selected set score to 1.

24. Energy is....

- • (a) the power consumption during an amount of time.
- o (b) when power is transformed into movement.
- o (c) the same as power.

If choice a is selected set score to 1.

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

- o (a)
  0,09 Ω
- • (b)
  11 Ω
- o (c)
  784 Ω

If choice b is selected set score to 1.

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

The capacitance....

o (a) will decrease.

• (b) will increase.

o (c) will not change.

If choice b is selected set score to 1.

27. Which kinds of electrolytic capacitors are in use?

o (a) Dry electrolytic.
o (b) Wet electrolytic.

• (c) Wet electrolytic and dry electrolytic.

If choice c is selected set score to 1.

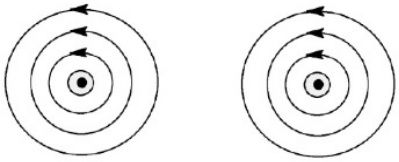
28. The charging and discharging current by a Capacitor is....

• (a) not in the same direction.

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

If choice a is selected set score to 1.

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



The wires will...

o (a) not influence each other.

• (b) attract each other.

o (c) repel each other

If choice b is selected set score to 1.

30. The earth magnetic poles are....

o (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.

If choice c is selected set score to 1.

31. Permanent magnets are used in....

- (a) devices with big and low power.
- (b) devices with big power.

- (c) devices with low power.

If choice c is selected set score to 1.

32. Ferromagnetic materials are....

- (a) magnetized easily.

- (b) never magnetized.
- (c) permanent strong magnetized.

If choice a is selected set score to 1.

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.

If choice b is selected set score to 1.

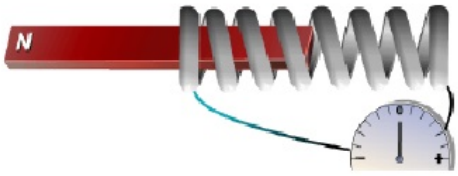
34. What are precautions for care and storage of magnets?

- (a) Magnets should be kept away from sensitive electronic equipment.

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

If choice a is selected set score to 1.

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.?

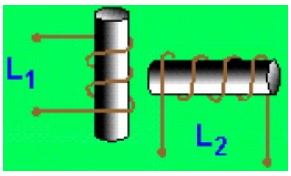


- (a) The needle will not deflect.

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

If choice a is selected set score to 1.

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



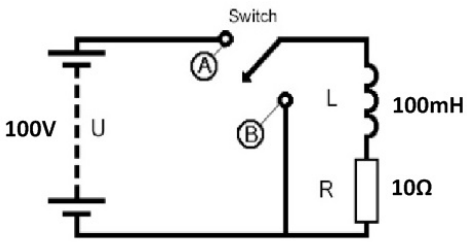
The mutual inductance is....

- (a) zero.

o (b) large.
o (c) small.

If choice a is selected set score to 1.

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



o (a) 6,3 A.
o (b) 0A.

- (c) 10 A.

If choice c is selected set score to 1.

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

o (a) The strength of the magnetic field.

• (b) The direction of the magnetic lines of flux.

o (c) The angle which the conductor cuts the magnetic field.

If choice b is selected set score to 1.

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

o (a) In series with the field windings.
o (b) Parallel with the armature.

• (c) In series with the armature.

If choice c is selected set score to 1.

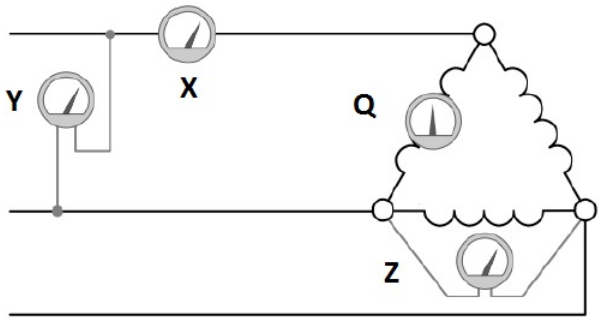
40. The term "frequency" indicates the number of complete wave cycles per....

• (a) second.

o (b) minute.
o (c) hour.

If choice a is selected set score to 1.

41. Which meter indicates the phase current?



o (a) Meter X.

• (b) Meter Q.

o (c) Meter Z.

If choice b is selected set score to 1.

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

- o (a) remain in phase with the voltage.
- • (b) lag the applied voltage by 90 degrees
- o (c) lead the applied voltage by 90 degrees.

If choice b is selected set score to 1.

43. What is impedance?

- o (a) The opposition to voltage in an AC circuit.
- • (b) The opposition to current flow in a AC circuit.
- o (c) The opposition to current flow in a DC circuit.

If choice b is selected set score to 1.

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...

- o (a) toward the generator in the circuit in order to have proper load.
- o (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.

If choice c is selected set score to 1.

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
- o (b) $^{10}/_{\sqrt{3}}$ A
- o (c) 30 A

If choice a is selected set score to 1.

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

- o (a) 100 A
- • (b) 0,1 A
- o (c) 1000 A

If choice b is selected set score to 1.

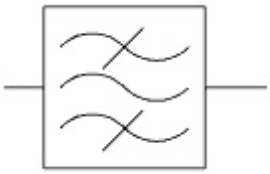
47. What is the "cut-off frequency" of a HP filter?

- (a) The frequency at which the filter starts to filter.

o (b) The frequency at which the filter will destroy itself.
o (c) The frequency at which the filter stops working.

If choice a is selected set score to 1.

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

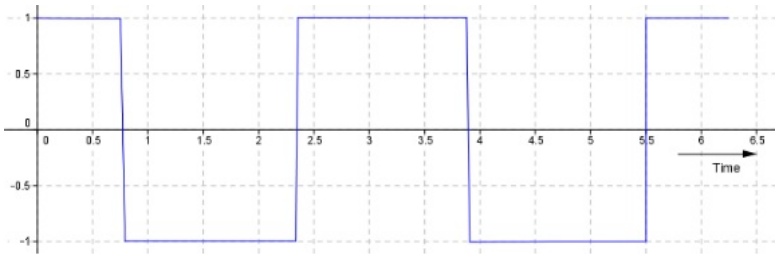


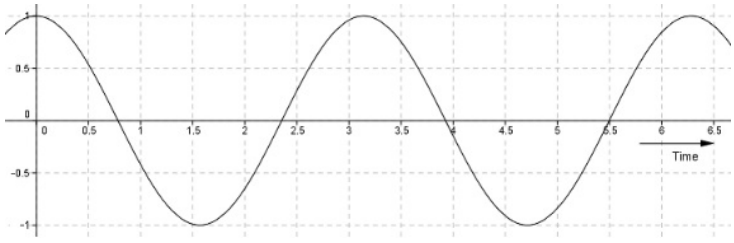
- (a) Band Pass Filter

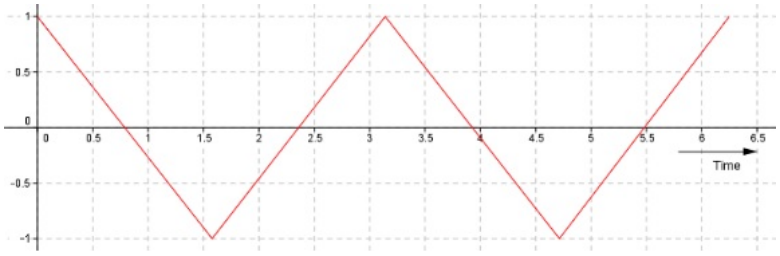
o (b) Low Pass Filter
o (c) Band Stop Filter

If choice a is selected set score to 1.

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

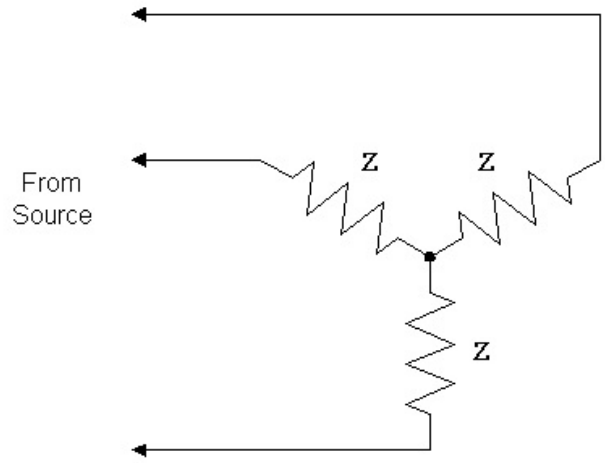
o (a) 

- (b) 

o (c) 

If choice b is selected set score to 1.

50. What kind of three phase connection is indicated?



- (a) Wye Connection

- (b) Delta Connection
- (c) X-Ray Connection

If choice a is selected set score to 1.

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.

If choice c is selected set score to 1.

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.

If choice a is selected set score to 1.

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