# Myfuture CBC Revision

# electricity - Grade 10

Question Paper

1. What does a short circuit mean in a D.C. circuit?

A. A burned-out fuse that opens the circuit

B. A low resistance path bypassing the intended load causing excessive current

C. A circuit with high resistance that limits current

D. A properly functioning circuit with safety devices

2. What is the direction of the built-in electric field in a p-n junction depletion region?

A. Always clockwise around the junction

B. From the n-side toward the p-side

C. From the p-side toward the n-side

D. There is no electric field in the depletion region

3. A compass needle points towards the Earth's magnetic north because the needle itself is a small magnet. Which pole of the needle points toward Earth's geographic north?

A. The needle's south-seeking pole

B. Neither pole; it points randomly

C. The needle's north-seeking pole

D. The needle's neutral point

4. Which rule helps determine the direction of the magnetic field around a straight current-carrying conductor?

A. Pythagoras rule

B. Right-hand rule (curling fingers around the wire)

C. Ohm's rule

D. Archimedes' rule

5. Which of the following is a disadvantage of underground cables compared to overhead lines?

A. Greater exposure to lightning strikes

B. They cause more visual pollution

C. Higher installation and repair costs

D. They require taller towers

6. Which of these is the correct unit for electrical resistance?

A. Ampere (A)

B. Ohm ()

C. Volt (V)

D. Watt (W)

7. Which particle in an atom is mainly responsible for carrying electric charge in a metal wire?

A. Photons

B. Neutrons

C. Protons

D. Electrons

8. What is the shape of magnetic field lines around a bar magnet?

A. Are straight lines pointing from south to north

B. Leave the north pole and enter the south pole forming closed loops

C. Form zigzag patterns around the magnet

D. Radiate outward forever from the center

9. Which device uses electromagnetism to convert electrical energy into mechanical energy?

A. Resistor

B. Light-emitting diode

C. Electric motor

D. Capacitor

10. Which law explains the induced emf in a coil when the magnetic flux through it changes?

A. Hooke's law

B. Newton's second law

C. Faraday's law of electromagnetic induction

D. Ohm's law

11. What happens to the brightness of bulbs when two identical bulbs are connected in series to a single cell?

A. Each bulb becomes brighter than when alone

B. Only one bulb lights while the other stays off

C. Each bulb becomes dimmer compared to a single bulb on the same cell

D. The bulbs do not light at all

12. Which device is used to measure electric current in a circuit?

A. Galvanometer connected across the resistor

B. Ohmmeter connected across the power supply while the circuit is powered

C. Ammeter connected in series with the circuit element

D. Voltmeter connected across the circuit element

13. Approximately what is the forward voltage drop of a silicon diode when conducting?

A. Exactly 5 volts

B. About 0.7 volts

C. Zero volts always

D. About 10 volts

14. Which of the following losses is mainly caused by the resistance of transmission lines?

A. I squared R (I^2R) losses

B. Dielectric heating losses

C. Battery discharge losses

D. Corona losses due to wind

15. What is the correct connection for a voltmeter when measuring the voltage across a lamp in a circuit?

A. Connected in parallel with the lamp

B. Connected between live and earth only

C. Connected in series with the lamp

D. Not connected to the circuit at all

16. What is electrical resistance a measure of in a conductor?

A. The energy delivered by the battery per second

B. The number of free electrons available

C. How strongly the conductor opposes the flow of electric current

D. How much charge is stored per unit voltage

17. What is the unit of electric potential difference (voltage)?

A. Volt

B. Watt

C. Ohm

D. Ampere

18. If a kettle uses 2000 W (watts) of power on 240 V supply, what is the current drawn (approx)?

A. About 480 A

B. About 8.3 A

C. About 0.12 A

D. About 200 A

19. Which colour combination is used for the protective earth (ground) wire in modern wiring standards?

A. Blue with white stripe

B. Plain brown

C. Red with black stripe

D. Green and yellow striped

20. What is a semiconductor?

A. A material that always conducts electricity better than copper
B. A material that cannot conduct electricity under any condition
C. A material that only works at very high temperatures

D. A material whose electrical conductivity is between that of a conductor and an insulator

21. Two bulbs are connected in series to a battery. If one bulb blows (filament breaks), what happens to the other bulb?

A. The other bulb becomes brighter

B. The other bulb decreases in resistance only

C. The other bulb remains unchanged

D. The other bulb goes out because the current stops

22. Which renewable project in Kenya harnesses wind energy to generate electricity?

A. Kipevu diesel plant

B. Lake Turkana Wind Power

C. Masinga hydroelectric dam

D. Olkaria geothermal plant

23. What is electricity in the simplest scientific sense?

A. A flow of electric charge such as electrons

B. A type of magnet that attracts metal objects

C. The light produced by the sun

D. Heat produced by burning fuel

24. In Kenya the standard mains supply voltage in a household is approximately:

A. 12 volts DC

B. 48 volts DC

C. 240 volts AC

D. 110 volts AC

25. What is a photodiode used for?

A. Detecting light and converting it into electric current

B. Increasing the mass of a circuit board

C. Cooling electronic devices

D. Providing a fixed reference voltage like a Zener diode

26. Two resistors of 4  and 6  are connected in series. What is their total resistance?

A. 10

B. 12

C. 0.667

D. 2.4

27. How does light affect the conductivity of a photoconductive semiconductor?

A. Light increases conductivity by creating extra electron-hole pairs
B. Light has no effect on any semiconductor

C. Light decreases conductivity by removing electrons

D. Light turns the semiconductor into a permanent magnet

28. What is the relationship between voltage (V), current (I) and resistance (R) expressed by Ohm's law?

A. $I = V \times R$

B. $R = V \times I$

C. $V = R \div I$

D. $V = I \times R$

29. What is a conductor that is used to protect people from electric shock by providing a low-resistance path to earth called?

A. Earth (or ground) wire

B. Insulator

C. Neutral wire

D. Live wire

30. What is the usual purpose of a step-up transformer at a power station?

A. To reduce the frequency of the electricity

B. To lower voltage for household use

C. To convert AC to DC for transmission

D. To increase voltage for efficient long-distance transmission

31. What is a solenoid?

A. A device that measures electric current

B. A type of battery used in physics labs

C. A coil of wire that produces a nearly uniform magnetic field when current flows

D. A permanent magnet made of steel

32. Which type of power plant uses flowing water to produce electricity?

A. Geothermal power plant

B. Hydroelectric power plant

C. Solar photovoltaic plant

D. Thermal (diesel) power plant

33. How can you demagnetise a soft iron core used in an electromagnet easily?

A. Switch off the current so domains randomise

B. Pour cold water over it

C. Press it hard between two surfaces

D. Expose it to sunlight

34. Which of the following is a characteristic of magnetic field lines?

A. They only exist inside magnets

B. They start and end at different locations

C. They point randomly without direction

D. They never cross one another

35. Which device uses a p-n junction to allow current to flow mainly in one direction and is used in phone chargers and power supplies in Kenya?

A. Diode (rectifier)

B. Transformer

C. Inductor

D. Capacitor

36. What happens to the magnetic domains of a piece of soft iron when it is placed in a magnetic field?

A. They rotate randomly with no change

B. They align in the direction of the field increasing magnetisation

C. They disappear completely

D. They become radioactive

37. What are the two ends of a bar magnet called?

A. Positive and Negative ends

B. Top and Bottom faces

C. North and South poles

D. Anode and Cathode

38. Why are iron nails placed inside the coil of an electromagnet in devices like cranes for scrap yards?

A. To make the magnet permanently magnetic

B. To prevent the coil from heating up

C. To concentrate and strengthen the magnetic field so they can lift heavy metal

D. To store electric charge

39. Which statement about insulators is correct?

A. Insulators produce electricity when heated

B. Insulators are always metals

C. Insulators increase current in a circuit

D. Insulators do not allow electric charges to flow freely

40. Which measurement describes the total amount of electrical energy used over time?

A. Kilovolt (kV)

B. Kilowatt-hour (kWh)

C. Hertz (Hz)

D. Ampere (A)

41. What is the correct direction of conventional current in a circuit?

A. From positive terminal to negative terminal of the supply

B. From earth to the positive terminal

C. From negative terminal to positive terminal of the supply

D. Always clockwise in a circuit diagram

42. Why is earthing (grounding) important in electrical distribution systems?

A. It increases the supply voltage to households

B. It provides a safe path for fault currents to reduce shock risk

C. It stores extra electricity for peak times

D. It prevents any need for circuit breakers

43. Which fuel is commonly used in Kenya for thermal power generation during dry seasons or when hydro is low?

A. Diesel or heavy fuel oil

B. Wind energy

C. Biogas from household waste

D. Hydrogen fuel cells

44. What is the main function of a protection relay in the power system?

A. Detect faults and signal circuit breakers to isolate the faulty section

B. Increase the delivered voltage during peak demand

C. Store energy during low demand periods

D. Convert DC to AC for distribution

45. Which of the following best describes a series circuit?

A. Current flows only through the earth wire

B. Each component is connected directly to the power source so there are many paths

C. Components are connected one after another so there is only one path for current

D. Components are not connected at all

46. What happens to a diode under reverse bias (n-side positive relative to p-side)?

A. Very little current flows until breakdown occurs

B. It conducts the same as in forward bias

C. It becomes a light source without any special construction

D. It changes into a resistor with fixed resistance

47. What is the most likely result if you connect the positive terminal of a cell directly to its negative terminal with a thick wire?

A. A large current flows and the cell may become hot or get damaged (short circuit)

B. The cell will stop producing electrons permanently but remain cool

C. The cell will produce more voltage than before

D. Nothing will happen because current needs a bulb

48. In Fleming's left-hand rule for motors, what does the middle finger represent?

A. Direction of the magnetic field

B. Polarity of the battery

C. Direction of motion (force)

D. Direction of the current

49. Which of these will increase the magnetic flux through a coil?

A. Moving a magnet faster towards the coil

B. Keeping the magnet stationary

C. Replacing the coil with a piece of plastic

D. Using a smaller magnet at the same speed

50. In a typical NPN transistor, which junctions are forward or reverse biased for normal active operation?

A. Biasing does not matter for transistor action

B. Both emitter-base and base-collector are reverse biased

C. Both emitter-base and base-collector are forward biased

D. Emitter-base is forward biased and base-collector is reverse biased