Myfuture CBC Revision
physics - Grade 10

Question Paper

1. Which statement best describes conservation of electric charge?

A. Charge can be created or destroyed freely

B. Positive charge is created while negative charge is destroyed

C. Total electric charge in an isolated system remains constant

D. Charge can be increased by rubbing insulating materials

2. Which of these substances shows the largest fractional change in volume for the same temperature increase?

A. A solid bar of iron

B. A block of granite

C. A gas in a container with a movable piston

D. A litre of water (above 4 °C)

3. Which thermometer is most suitable for measuring very low temperatures in a Kenyan school lab (below 80 °C)?

A. Digital thermistor thermometer designed for low temperatures

B. Alcohol thermometer

C. Clinical mercury thermometer

D. Mercury-in-glass thermometer

4. Why do scientists monitor sea surface temperature when studying climate change?

A. Because warmer oceans influence weather patterns, evaporation and storm intensity

B. Because it measures the depth of the sea

C. Because it shows the amount of plastic pollution

D. Because it tells us the number of fish in the ocean

5. What is electric potential (voltage) at a point?

A. Charge per unit mass at that point

B. Force experienced by a charged particle at that point

C. Work done per unit charge to bring a small positive test charge from infinity to that point

D. Magnetic field strength at that point

6. What is the solar cycle?

A. A daily heating and cooling of the Sun

B. An approximately 11-year cycle during which the Sun's magnetic activity, sunspot number

C. The yearly change in Earth’s orbit around the Sun

D. The time it takes for sunlight to reach Earth

7. Why is the actual efficiency of real machines always less than 100%?

A. Because machines create energy

B. Because output energy is greater than input

C. Because input energy is always zero

D. Because some energy is lost to friction and heat

8. Which particle is emitted in alpha decay?

A. A single electron emitted from the nucleus

B. A free proton ejected from the nucleus

C. A helium nucleus containing two protons and two neutrons

D. A high-energy photon with no mass or charge

9. What does 1 becquerel (1 Bq) represent?

A. One million decays per second

B. One radioactive decay per second

C. One gray of absorbed dose

D. One joule of energy released per second

10. What is mechanical advantage (MA) of a simple machine?

A. The ratio of input distance to output distance

B. The power used by the machine

C. The fraction of energy lost as heat

D. The ratio of output force to input force

11. What protects astronauts from many of the charged particles in the solar wind when they are on Earth?

A. The colour of their space suits

B. The speed of the spacecraft alone

C. Earth's magnetosphere and atmosphere

D. The presence of clouds

12. How can strong solar storms affect life and technology on Earth?

A. They cause earthquakes

B. They can disrupt radio and satellite communications, damage power grids and

C. They only increase daylight hours temporarily

D. They make the air colder for several days

13. What is meant by 'space weather'?

A. Daily weather forecasts for astronauts inside the ISS

B. The style of clothing astronauts wear

C. Conditions in space driven by the Sun such as solar wind, flares and geomagnetic storms that

D. The temperature of spacecraft surfaces only

14. What is diffraction?

A. Change in wave frequency due to motion

B. Bending and spreading of waves around obstacles or through openings

C. Absorption of waves by a medium

D. Reflection of waves from a plane surface

15. What does the term 'escape velocity' refer to?

A. The minimum speed an object needs to leave a planet's gravitational influence without

B. The speed a satellite must have to remain in geostationary orbit

C. The maximum speed a car can travel on Earth

D. The speed at which light escapes from the Sun

16. Which of the following best explains why seasons occur on Earth?

A. Because the Sun becomes hotter and cooler during the year

B. Because clouds block more Sun in some months

C. Because Earth's axis is tilted relative to its orbital plane, causing varying solar heating at

D. Because Earth moves closer to the Sun in summer and farther in winter

17. For a lever in equilibrium, the mechanical advantage equals:

A. Length of effort arm ÷ length of load arm

B. Effort × load arms

C. Length of load arm ÷ length of effort arm

D. Sum of arm lengths

18. What is the SI unit of energy?

A. Joule

B. Pascal

C. Newton

D. Watt

19. When an object moves around a closed path and returns to its starting point under only a conservative force (e.g. gravity), the net work done by that force is:

A. Positive and equal to initial kinetic energy

B. Negative and equal to final kinetic energy

C. Zero

D. Equal to the object's mass

20. Approximately how many watts are in one horsepower?

A. 746 W

B. 9.8 W

C. 100 W

D. 3600 W

21. Which orbit is best for Earth observation satellites that need to pass over every part of Earth including Kenya?

A. Polar or sun-synchronous low Earth orbit

B. Very high elliptical orbit beyond the Moon

C. Geostationary orbit directly above the equator

D. Escape trajectory out of Earth's gravity

22. What does the mass defect of a nucleus represent?

A. The mass of the atomic shell only

B. The difference in mass between the separated nucleons and the actual nucleus,
C. The extra mass added when a nucleus emits radiation

D. The mass of the electrons lost during decay

23. Which of the following is an example of a longitudinal wave?

A. Radio waves

B. Waves on a water surface

C. Sound waves in air

D. Light waves in air

24. During a practical, a pupil measures a force of 20 N acting on a plate of area 0.5 m^2. What is the pressure on the plate?

A. 10 Pa

B. 40 Pa

C. 100 Pa

D. 400 Pa

25. Which type of energy is stored in a stretched spring?

A. Thermal energy

B. Chemical energy

C. Elastic potential energy

D. Kinetic energy

26. What is an antinode in a standing wave?

A. A point where the wave is reflected

B. The wavelength of the wave

C. A point of zero amplitude

D. A point of maximum amplitude

27. What type of wave is a sound wave in the air?

A. Electromagnetic wave

B. Transverse wave

C. Surface wave

D. Longitudinal wave

28. Which statement best describes thermal equilibrium between two bodies?

A. They are in physical contact only

B. They have the same mass

C. They have the same volume

D. They are at the same temperature and there is no net heat flow between them

29. In what main way does Earth's magnetic field protect life on the surface?

A. By increasing the amount of oxygen in the atmosphere

B. By deflecting many charged particles from the solar wind and cosmic rays away from the
C. By making the air warmer so living things survive

D. By preventing clouds from forming

30. Two springs are joined in series. How does the effective spring constant compare to the individual spring constants k1 and k2?

A. keff = (k1*k2)/(k1 + k2)

B. keff = max(k1, k2)

C. keff = k1 + k2

D. keff = (k1 + k2)/2

31. Which expression gives the increase in pressure in a liquid due to a depth h below the surface?

A. Density × gravitational acceleration × depth (gh)

B. Pressure divided by temperature (p/T)

C. Mass × acceleration (ma)

D. Force × area (FA)

32. Which measurement is most useful for identifying longterm climate change rather than shortterm weather variations?

A. Wind speed at one moment

B. The temperature on a single afternoon

C. Rainfall measured during a single storm

D. Average temperature trends over decades

33. Which of these statements about pressure in a liquid is true?

A. Pressure depends only on the shape of the container

B. Pressure decreases with depth in the liquid

C. Pressure is the same at all depths

D. Pressure increases with depth in the liquid

34. What are sunspots?

A. Permanent black spots that block sunlight to Earth

B. Holes in the Sun that let solar wind escape

C. Cooler, darker regions on the Sun's surface associated with strong magnetic activity
D. Areas where planets are forming around the Sun

35. Carbon-14 dating is most useful for which type of material?

A. Igneous rocks like lava flows

B. Once-living organic remains such as wood or bones

C. Pure metals such as iron or copper

D. Fresh water samples from rivers

36. Which type of wave can travel through a vacuum?

A. Water surface waves

B. Electromagnetic waves (e.g., light)

C. Slinky compression waves

D. Sound waves

37. Which statement best describes conservation of energy in a closed system?

A. Kinetic energy always increases

B. Total energy remains constant though it may change forms

C. Some energy is always lost and total energy decreases

D. Energy can be created as long as power is conserved

38. Which particle is most common in the solar wind that reaches Earth?

A. Electrons only

B. Protons

C. Helium nuclei only

D. Neutrons

39. Which of these best describes 'work done' when there is no displacement?

A. Equal to the energy used by the muscles

B. Zero; no work is done

C. Equal to the force applied

D. Equal to the mass times acceleration

40. A brass lid on a jar is difficult to remove. Which practical method based on thermal expansion will help remove it?

A. Freeze both jar and lid so they contract together

B. Heat the jar to make both expand equally

C. Cool the lid so it expands and becomes loose

D. Heat the lid briefly so the lid expands more than the jar

41. If you press a thumbtack into a wall, why does the point pierce the wall more easily than the blunt end?

A. Because the blunt end is heavier

B. Because the point has a larger mass

C. Because the point has a smaller area and so produces a larger pressure for the same force

D. Because the point produces less force

42. Which temperature is equivalent to 0 K on the Celsius scale?

A. -273.15 °C

B. 273.15 °C

C. 0 °C

D. 100 °C

43. Which human activity is the largest source of methane (CH_4) in Kenya?

A. Drinking tap water

B. Using solar panels on roofs

C. Riding a bicycle

D. Enteric fermentation in livestock (cattle and goats)

44. What is the useful purpose of a second-class lever (like a wheelbarrow)?

A. To increase the speed at which the load moves at the expense of force

B. To change the direction of the input force with no advantage

C. To store energy as potential energy

D. To give mechanical advantage so the effort needed is less than the load

45. Which of the following is a common peaceful application of radioisotopes in Kenya and worldwide?

A. Replacing textbooks with radioactive ones

B. Using alpha particles to light classrooms

C. Radiotherapy to treat cancer

D. Heating homes by placing isotopes in rooms

46. What happens when a negatively charged rod touches a neutral metal sphere (charging by conduction)?

A. The sphere becomes positively charged because electrons leave

B. The rod loses positive charges to the sphere

C. No charge transfer occurs because the sphere is neutral

D. Electrons flow onto the sphere and it becomes negatively charged

47. What is a satellite in the context of space physics?

A. A meteor that never enters Earth's atmosphere

B. A large observatory placed only on the Moon

C. Any natural or human-made object that orbits a planet

D. A device that always stays stationary above one point on Earth

48. What is space physics mainly concerned with?

A. The study of animal adaptation to space environments

B. The physical processes that occur in space such as the solar wind, magnetic fields and

C. The chemical composition of household materials

D. The behaviour of Earth's interior rocks under pressure

49. What does the term 'anthropogenic' mean in climate studies?

A. Caused by alien life

B. Caused by human activities

C. Caused by the Sun's regular cycle

D. Caused by volcanic eruptions

50. Why does Earth have a magnetosphere?

A. Because of the presence of large amounts of iron ore on the surface

B. Because the Sun's gravity pulls magnetic field lines around Earth

C. Because of the alignment of tectonic plates

D. Because moving molten iron in Earth's outer core generates a magnetic field that deflects