Myfuture CBC Revision

physics - Grade 10

Question Paper

1. Which machine would most reduce the effort needed to raise a heavy bucket from a well?

A. A single fixed pulley

B. A system of many movable pulleys

C. An inclined plane lying flat on the ground

D. A wedge

2. Why must satellite engineers consider the Van Allen belts when designing missions?

A. Because satellites can land in the belts to refuel

B. Because trapped radiation can damage electronics and harm astronauts, so shielding or
C. Because the belts provide free power to satellites

D. Because the belts block sunlight needed for solar panels

3. Why can alpha particles be stopped by a sheet of paper?

A. Because they are neutrinos that rarely interact

B. Because they travel at the speed of light and are deflected

C. Because they are heavy and carry a positive charge so they lose energy quickly in matter
D. Because they are massless and pass through without interacting

4. A plastic comb becomes charged after being rubbed on dry hair. Which statement correctly explains the charging process?

A. Neutrons are transferred from hair to comb

B. Electrons move from the hair to the comb, leaving hair positive and comb negative
C. Protons move from the comb to the hair leaving the comb negative
D. Both objects gain equal numbers of protons

5. Which of the following is a correct example of charging by friction?

A. Connecting a charged object directly to earth with a wire

B. Placing two neutral conductors together without rubbing

C. Bringing a charged rod close to an uncharged metal without touching
D. Rubbing a plastic comb on a wool sweater and the comb becoming negatively charged

6. What is a carbon sink?

A. A machine that burns fossil fuels

B. A factory that emits carbon dioxide

C. A waste pit used by households

D. A natural reservoir like forests or soils that removes and stores CO2 from the atmosphere

7. What is space physics mainly concerned with?

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

B. The chemical composition of household materials

C. The physical processes that occur in space such as the solar wind, magnetic fields and
D. The study of animal adaptation to space environments

8. What is diffraction?

A. Bending and spreading of waves around obstacles or through openings
B. Absorption of waves by a medium

C. Change in wave frequency due to motion

D. Reflection of waves from a plane surface

9. What does the frequency of a wave measure?

A. The distance between two crests

B. The height of a crest above equilibrium

C. The time taken for a wave to travel one metre

D. The number of waves passing a point per second

10. A student lifts a 2 kg textbook vertically upward by 0.5 m at constant speed. What is the work done against gravity? (Take g = 9.8 m/s^2)

A. 19.6 J

B. 98 J

C. 4.9 J

D. 9.8 J

11. Which law describes the linear relationship between stress and strain for small deformations in an elastic material?

A. Newton's second law

B. Pascal's law

C. Hooke's law

D. Archimedes' principle

12. If the distance between two fixed point charges is doubled, how does the magnitude of the electrostatic force change?

A. It becomes half of its original value

B. It remains the same

C. It doubles

D. It becomes one quarter of its original value

13. What is the SI unit of frequency?

A. Joule

B. Metre

C. Second

D. Hertz

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

A. Electromagnetic wave

B. Surface wave

C. Transverse wave

D. Longitudinal wave

15. If a wire carries a weight causing a force of 100 N and the cross-sectional area is 2 x 10^-6 m^2, what is the tensile stress in the wire?

A. 2 x 10^-8 Pa

B. 5 x 10^7 Pa

C. 5 x 10^4 Pa

D. 2 x 10^6 Pa

16. What is the solar wind?

A. A flow of cold gas from the Sun toward Earth during night time

B. Invisible light that pushes satellites away from orbit

C. A stream of charged particles (plasma) flowing out from the Sun because the hot

D. A breeze of neutral dust blown off the Sun's surface by sunlight

17. Between two equal positive charges separated by a distance, where is the electric field zero?

A. Outside, infinitely far from both charges only

B. At the midpoint between the two charges

C. There is no point where it can be zero

D. Exactly at the position of one charge

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

A. Light waves in air

B. Sound waves in air

C. Radio waves

D. Waves on a water surface

19. What is the direction of the electrostatic force between two like charges?

A. They have no force between them

B. They rotate around each other

C. They repel each other

D. They attract each other

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

A. Replacing textbooks with radioactive ones

B. Heating homes by placing isotopes in rooms

C. Using alpha particles to light classrooms

D. Radiotherapy to treat cancer

21. What happens to radio signals during a strong geomagnetic storm?

A. High-frequency radio propagation can be disrupted and satellite signals may be degraded
B. All radio signals become stronger and clearer

C. Radio signals turn into visible light

D. Radio signals are permanently blocked worldwide

22. If the amplitude of a wave doubles, how does its energy change (for a mechanical wave)?

A. Energy increases four times

B. Energy halves

C. Energy doubles

D. Energy stays the same

23. What does the study of electrostatics focus on?

A. Heat produced by electric currents

B. Electric charges at rest

C. Magnetic fields around wires with current

D. Electric charges in motion producing current

24. Why must a satellite in geostationary orbit be positioned above the equator?

A. Because satellites need ocean water below them to cool down
B. Because the atmosphere is thickest at the equator

C. Because the Moon pulls satellites away from other latitudes
D. Because only an orbit in Earth's equatorial plane with the same rotational period keeps the

25. A constant force F acts in the same direction as displacement s. Which formula gives the work done by the force?

A. W = F + s

B. W = Fs

C. W = F/s

D. W = F - s

26. What is the magnitude of the elementary charge (the magnitude of the charge of an electron)?

A. 6.0 × 10^23 C

B. 1.0 × 10^-6 C

C. 9.0 × 10^9 C

D. 1.6 × 10^-19 C

27. In a transverse wave, how do particles of the medium move relative to the direction of wave travel?

A. In circular paths around the direction of travel

B. They do not move at all

C. Perpendicular to the direction of wave travel

D. Parallel to the direction of wave travel

28. Which outcome is expected when the temperature of a metal is increased, holding stress constant, near but below its melting point?

A. Its Young's modulus increases significantly

B. It becomes more brittle

C. Its density increases

D. It generally becomes more ductile and Young's modulus may decrease

29. How can strong solar storms affect satellites?

A. They make satellites invisible to the human eye so they drop out of orbit
B. They cool satellites so they stop communicating

C. They can damage satellite electronics, disturb communications and change satellite
D. They permanently turn satellites into stars

30. Convert 2.5 kPa to pascals.

A. 25 Pa

B. 2.5 Pa

C. 2500 Pa

D. 250 Pa

31. What does the field of space physics study?

A. The physical conditions and processes in space, including the Sun, solar wind, Earth's
B. How to build houses that survive windstorms

C. The chemical composition of rocks on Earth only

D. Only how rockets move between Earth and the Moon

32. Which mechanical property is best described as a material's ability to absorb energy and plastically deform without fracturing?

A. Hardness

B. Malleability

C. Brittleness

D. Toughness

33. What is a wavefront?

A. The height of a wave above equilibrium

B. A line joining points on a wave that are in phase

C. The path taken by a single particle of the medium

D. The point where a wave stops

34. A block is pulled along a horizontal surface with force 50 N at an angle of 60° above the horizontal for 4 m. What is the work done by the force in the horizontal direction?

A. 200 J

B. 100 J

C. 400 J

D. 50 J

35. Which of these nuclei is most likely to be stable?

A. Polonium-210 (84 protons, 126 neutrons)

B. Carbon-12 (6 protons, 6 neutrons)

C. Uranium-238 (92 protons, 146 neutrons)

D. A nucleus with equal mass and atomic numbers

36. If an isolated conducting sphere carries a net positive charge, where does this charge reside?

A. Only at points of contact with air molecules

B. Uniformly throughout the interior

C. On the surface of the sphere

D. Concentrated only at the centre

37. A boat floats because of buoyancy. Which pressure-related reason explains this?

A. Pressure pushes the boat downwards only

B. Pressure on the bottom of the boat is greater than pressure on the top, producing an upward
C. Pressure is the same everywhere so the boat floats by magic
D. Pressure does not act on liquids

38. What is the ideal mechanical advantage (IMA) of an inclined plane?

A. Height Length

B. Height ÷ Length of slope

C. Length of slope ÷ Height

D. Height × Length

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

A. The extra mass added when a nucleus emits radiation

B. The difference in mass between the separated nucleons and the actual nucleus,
C. The mass of the electrons lost during decay

D. The mass of the atomic shell only

40. Why do satellites in low Earth orbit (LEO) eventually lose altitude if nothing else is done?

A. Because sunlight pushes them straight into the ground

B. Because even the thin upper atmosphere at LEO produces drag that slowly removes orbital
C. Because gravity stops acting on them after a few months

D. Because the Moon pulls all LEO satellites away from Earth quickly

41. What is a magnetometer used for in space missions?

A. To measure soil moisture

B. To detect sound waves in vacuum

C. To measure temperature on the Moon

D. To measure magnetic fields in space or around planets

42. What happens to the atomic number during beta-minus decay?

A. It increases by 2 and the mass number increases by 4

B. It remains unchanged while the mass number decreases by 1

C. It increases by 1 while the mass number remains the same

D. It decreases by 1 while the mass number remains the same

43. Which expression defines power?

A. Power = force ÷ distance

B. Power = energy × time

C. Power = force × time

D. Power = energy transferred ÷ time

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

A. Sum of arm lengths

B. Length of load arm ÷ length of effort arm

C. Length of effort arm ÷ length of load arm

D. Effort × load arms

45. What is the formula for kinetic energy of a moving object?

A. KE = mg

B. KE = 1/2 mv^2

C. KE = Fd

D. KE = mgh

46. What does the activity of a radioactive sample measure?

A. The brightness of light emitted by the sample

B. The number of nuclear decays occurring per unit time

C. The temperature rise caused by the sample

D. The total mass of the radioactive sample

47. What are sunspots?

A. Permanent black spots that block sunlight to Earth

B. Areas where planets are forming around the Sun

C. Holes in the Sun that let solar wind escape

D. Cooler, darker regions on the Sun's surface associated with strong magnetic activity

48. What is the main difference between meteoroids, meteors and meteorites?

A. Meteoroids are in space, meteors are the light trails in the atmosphere, meteorites reach

B. There is no difference; they are three names for the same thing

C. Meteoroids are icy, meteors are gaseous, meteorites are liquid

D. Meteoroids are stars, meteors are planets, meteorites are moons

49. What is the half-life of a radioactive substance?

A. The time it takes for all the nuclei in a sample to decay

B. The time it takes for the sample to become non-radioactive because of cooling

C. The time required for half of the original nuclei in a sample to decay

D. The time during which the energy of the sample doubles

50. Why are radio telescopes and observatories often located far from cities?

A. Because cities have stronger gravity that distorts observations

B. To avoid human-made radio frequency interference and light pollution that would

C. Because telescopes need to be near deserts only

D. Because scientists do not like living near cities