S1. Ans.(b)
Sol. The Amoeba proteus is a large protozoan and belongs to the Phylum Sarcodina. It has an ever-changing shape and is approximately 500-1000μnm long. It can almost be seen with the naked eye.

S2. Ans.(d)
Sol. Electrocardiography is the process of producing an electrocardiogram, a recording - a graph of voltage versus time - of the electrical activity of the heart using electrodes placed on the skin.

S3. Ans.(b)
Sol. Beta-lactamases are enzymes produced by bacteria that provide multi-resistance to β-lactam antibiotics such as penicillin's, cephalosporins, cephamycin's, and carbapenems (ertapenem), although carbapenems are relatively resistant to beta-lactamase

S4. Ans.(c)
Sol. Lysosomes are the membrane bound vesicular structures formed by Golgi apparatus. These vesicles on isolation have been found to be rich in all types of hydrolytic enzymelike., hydrolase, lipases, proteases and carbohydrase's which digest carbohydrates proteins, lipids and nucleic acid at acidic PH.

S5. Ans.(c)
Sol. Cholera is an infectious disease that causes severe watery diarrhea, which can lead to dehydration and even death if untreated. It is caused by eating food or drinking water contaminated with a bacterium called Vibrio cholerae.

S6. Ans.(b)
Sol. Power = V × I

$$Power = \frac{V^2}{R}$$

$$Power \propto \frac{1}{R}$$

New resistance $R = \rho \frac{L}{A}$

∵ wire A   Wire B

$r_A = r$ $r_\beta = 2r$

$L_A = L$ $L_B = 2L$

$P_A = P$ $P_B = P_1$

Now,

$$\frac{P_1}{P} = \frac{\rho \times \frac{L}{A}}{\rho \times \frac{L_1}{A_1}} \Rightarrow \frac{L}{A} \times \frac{A_1}{L_1}$$

$$\Rightarrow \frac{L}{\pi r^2} \times \frac{\pi(2r)^2}{2L} = \frac{4}{2} = 2$$

$$\frac{P_1}{P} = 2$$

$$P_1 = 2P$$

$$\boxed{P = \frac{P_1}{2}}$$

S7. Ans.(d)
Sol. The magnetic field inside a solenoid is proportional to both the applied current and the number of turns per unit length. There is no dependence on the diameter of the solenoid, and the field strength doesn't depend on the position inside the solenoid, i.e., the field inside is constant.

S8. Ans.(a)
Sol. It is the distance that light can travel in one year. Light moves at a velocity of about 300,000 kilometers (km) each second. So, in one year, it can travel about 10 trillion km.

S9. Ans.(c)
Sol. Magnification $= \frac{f_{obj}}{f_{eye}}$, $f_{eye} = \frac{50}{25} = 2cm$

S10. Ans.(a)
Sol. Forces that do not store energy are called nonconservative or a dissipative force. Friction is a nonconservative force, and there are others. Any friction-type force, like air resistance is a nonconservative force.

S11. Ans.(a)
Sol. Copper turns green because of a process known as oxidation which is the removal of electrons from the substance. Specifically, copper turns green because of something known as copper carbonate. This is the substance that is found on top of copper–whether they be copper pipes, pennies, statues or anything else. So, the cause of copper turning green is copper carbonate.

S12. Ans.(b)

S13. Ans.(d)
Sol. Honey is a pure substance! Honey is made through a process where bee's collect nectar. The nectar from the substance cannot be separated. Although honey does have a uniform property it cannot be separated a mixture, whether it be heterogeneous or homogenous, implies the ability of a substance be separated.

S14. Ans.(b)
Sol. Crystal growth often occurs when groundwater moves into empty pores or spaces of rock by capillary action. As the water evaporates, salt crystals grow and accumulate, putting pressure on the rock and causing it to break apart. Salt crystallization is common in drier climates.

S15. Ans.(d)
Sol. Tooth enamel is the hardest, most highly mineralized substance in the body. It forms the outer, most visible layer of each tooth. Enamel is composed of hydroxyapatite, a mineral compound of calcium and phosphate.

S16. Ans.(b)

S17. Ans.(c)
Sol. Ribosome cell organelle does not possess nucleic acid.

S18. Ans.(a)

S19. Ans.(d)
Sol. Sieve tubes is not a component of conducting tissue in plants

S20. Ans.(c)

S21. Ans.(b)

S22. Ans.(c)
Sol. Energy, potential energy, is stored in the covalent bonds holding atoms together in the form of molecules. This is often called chemical energy.

S23. Ans.(d)

S24. Ans.(c)

S25. Ans.(d)
Sol. Uraninite, formerly pitchblende, is a radioactive, uranium-rich mineral and ore with a chemical composition that is largely UO_2, but due to oxidation the mineral typically contains variable proportions of U_3O_8. Additionally, due to radioactive decay, the ore also contains oxides of lead and trace amounts of helium.

S26. Ans.(d)
Sol. A synthetic detergent is the sodium salt of sulphonic acid which has cleansing properties in water. Structure of Molecule of Detergent. The structure of a synthetic detergent is like that of soaps. It consists of a long hydrocarbon chain which is hydrophobic and a short ionic part which is hydrophilic.

S27. Ans.(d)

S28. Ans.(a)
Sol. Metals low in the metal reactivity series do not react with water even at high temperature. Calcium (Ca) It reacts slowly with cold water.

S29. Ans.(b)
Sol. Isoelectronic refers to two atoms, ions or molecules that have the same electronic structure and the same number of valence electrons. The term means "equal electric" or "equal charge". Isoelectronic chemical species typically display similar chemical properties.

S30. Ans.(d)
Sol. Silicone resin emulsion paints thus bestow permanent water-repellency, which stems from the organic group on the silicone resin. The inorganic portion of the silicone resin "cements" the filler and the pigment together, creating permanently water-repellant capillaries and pores.

S31. Ans.(b)
Sol. This is because of the refraction of the light from the Sun by the Earth's atmosphere--the Earth's atmosphere bends the path of the light so that we see the Sun in a position slightly different from where it really is. The magnitude of this effect varies with latitude, but it's strongest at the equator, where the Sun rises 2 minutes earlier than it would if the Earth had no atmosphere, and sets 2 minutes after it would if the Earth had no atmosphere.

S32. Ans.(b)

S33. Ans.(d)
Sol. 1 Dyne, unit of force in the centimeter-gram-second system of physical units, equal to the force that would give a free mass of one gram an acceleration of one centimeter per second per second. One dyne equals 0.00001 newton.

S34. Ans.(c)

S35. Ans.(c)

S36. Ans.(c)
Sol. Black holes of stellar mass are expected to form when very massive stars collapse at the end of their life cycle. After a black hole has formed, it can continue to grow by absorbing mass from its surroundings.

S37. Ans.(a)

S38. Ans.(b)
Sol. The colour which deviates least in the formation of spectrum of white light by a prism is. When white light falls on a glass prism, each colour in it is refracted by a different angle, from which red colour is least deviated and violet most.

S39. Ans.(a)
Sol. A fuse wire is an electrical instrument used for reducing the damage of electrical appliances when a high current pass into the wire. A fuse wire should have more resistance and a low melting point

S40. Ans.(c)
Sol. Displacement reaction is a chemical reaction in which a more reactive element displaces a less reactive element from its compound. Both metals and non-metals take part in displacement reactions.

S41. Ans.(c)
Sol. It is an organic compound that is classified as a carboxylic acid because a carboxyl (-COOH) group is present in its chemical structure. Acetic acid is also known as the second simplest carboxylic acid.

S42. Ans.(a)

S43. Ans.(b)
Sol. The photoelectric effect is a phenomenon where electrons are emitted from the metal surface when the light of enough frequency is incident upon. This implies that the kinetic energy of electrons increases with light intensity.

S44. Ans.(b)
Sol. Molecular weight = 126
n factor = 2
Equivalent weight = 126 ÷ 2
= 63

S45. Ans.(b)
Sol. Static charge only builds up on insulators. These are materials that will not allow the flow of charged particles (nearly always electrons) through them. Insulators are materials made from atoms that hold onto their electrons very strongly.

S46. Ans.(c)
Sol. Sound waves tend to travel faster at higher temperatures. I have found different values for the speed of sound in water in different sources. They range from 1450 to 1498 meters per second in distilled water and 1531 m/s in sea water at room temperatures (20 to 25 °C).

S47. Ans.(d)
Sol. Iron has a melting point of 1535.0 degrees Celsius or 2795.0 degrees Fahrenheit

S48. Ans.(d)
Sol. The resistance $R = \rho \frac{L}{A}$

Now, $l_1 = \frac{l}{2}$

$r_2 = 2r$

$\frac{R_1}{R} = \frac{L_1}{A_1} \times \frac{A}{L} = \frac{L}{2 \times \pi 4r^2} \frac{r^2}{l}$

$R_1 = \frac{R}{8}$

S49. Ans.(d)
Sol. Nuclear reactors operate on the principle of nuclear fission, the process in which a heavy atomic nucleus splits into two smaller fragments.