

**Science and Technology Marathon of 2024-2025****Class: 9 & 10****BIOLOGY**

- 1) Branch of biology that deals with classification? (Taxonomy)
- 2) What do a group of organs make? (System)
- 3) Name the process by which the energy is released. (Respiration)
- 4) Name the powerhouse of the cell. (Mitochondria)
- 5) Name the protein factory of the cell. (Ribosome)
- 6) Name the nutrition in which the raw materials are taken only in the liquid to the gaseous form? (Halophytic)
- 7) Name the plastids, which are green in colour. (Chloroplast)
- 8) Name the plastids, which store food. (Leucoplast)
- 9) Name the locomotory organ of Euglena. (Flagella)
- 10) Name the locomotory organ of Amoeba. (Pseudopodia)
- 11) Name the locomotory organ of Paramecium. (Cilia)
- 12) Name the carriers of hereditary units. (Genes)
- 13) What is the full form of RNA? (Ribo-nucleic acid)
- 14) What is the full form of DNA? (De-Oxy ribonucleic acid)
- 15) Name the fundamental units of classification. (Species)
- 16) What are the bodies of thallophytes called? (Thallus)
- 17) What are fibrous roots also called? (Adventitious roots)
- 18) Name an animal, which does not move. (Sponge)
- 19) Name a plant which moves. (Chlamydomonas)
- 20) Organisms which live on living things are called (Parasites)
- 21) Name those organisms which live on dead things called (Saprophytes)
- 22) Name the hollow cavity of coelenterates. (Coelenteron)
- 23) Name the body covering of insects. (Chitinous Cuticle)
- 24) Name the phylum, which includes the largest species of animals. (Arthropoda)
- 25) Name the animal, which has 5 arms. (Star-fish)
- 26) Name the animal, which has 8 tentacles. (Octopus)
- 27) What is the upward movement of water and minerals in plants called? (Ascent of sap)
- 28) Name the respiratory organs of insects. (Trachea)
- 29) Where is bile stored? (Gall-bladder)
- 30) What type of bacteria are present in the roots of leguminous plants. (Symbiotic bacteria)
- 31) Name the process of changing lumps of fats into drops of fats. (Emulsification)
- 32) What is the movement of the muscles of esophagus called? (Peristalsis)
- 33) What is the larva of housefly called? (Maggot)
- 34) Name the root like structures of prothallus of ferns. (Rhizoids)
- 35) Who is called the father of Genetics? (Gregor Mendel)
- 36) What is the offspring having both dominants and recessive characters called? (Hybrid)
- 37) Name the microscopic producers of a pond Eco-system. (Phytoplankton)
- 38) Name one microscopic consumer of a pond Eco-system. (Zooplankton)
- 39) Name the blood corpuscles having nucleus WBC (White Blood Corpuscles)
- 40) Name the blood vessels, which lie near the surface of the body. (Veins)
- 41) Name the blood vessel going to the lungs. (Pulmonary artery)
- 42) Name the blood vessel coming from the lungs. (Pulmonary Vein)
- 43) Name the artery going to the liver. (Hepatic artery)
- 44) Name the vein coming from the liver. (Hepatic Vein)
- 45) Name the vein going to the liver from the digestive system. (Hepatic portal vein)
- 46) Name the valve present between the right auricle and ventricle. (Tricuspid valve)
- 47) What is the thickest chamber of the heart called? (Left Ventricle)
- 48) Name the process in which the end product is Lactic Acid. (Anaerobic respiration)
- 49) Name the largest National Park in Nepal. (SheyPhoksundo National Park)
- 50) Name the smallest National Park in Nepal. (Rara National Park)
- 51) What is the round mass of chewed food in the mouth called? (Bolus)
- 52) Which tissue is commonly called wood? (Xylem tissues)
- 53) Name the tissues, which constitute nearly half of our body. (Muscular tissue)

- 54) Muscles found only in the heart. (Cardiac Muscles)
- 55) Name the hammer shaped bone found in the middle ear. (The Malleus)
- 56) Name the vision which is important in judging the distance to depth of an object. (Binocular vision)
- 57) Where are aerenchyma tissues found? (In aquatic plants)
- 58) Name the skeleton, which forms the brain box. (The Cranium)
- 59) Name the hard substance, which forms the bulk of a tooth. (Dentine)
- 60) What are the vertebrae in neck region called? (Cervical Vertebrae)
- 61) What are the vertebrae of chest region called? (Thoracic Vertebrae)
- 62) How many vertebrae are present in the sacral region? (5)
- 63) What is the 1<sup>st</sup> vertebra called? (Atlas)
- 64) Name the 2<sup>nd</sup> vertebra. (Axis)
- 65) What are the last 2 pairs of ribs called? (Floating ribs)
- 66) Name the bone supporting the thigh. (Femur)
- 67) The place in the brain where the nerves of the right and left cross-over. (Medulla)
- 68) What type of action is a reflex action? (Involuntary action)
- 69) Name the white area of the eye (Sclera)
- 70) What is the transparent bulge in front of the eye called? (Cornea)

## CHEMISTRY

- 1) What are the elements in hydrocarbon? (Hydrogen and carbon)
- 2) In the homologous series of alkanes, by how many carbon and hydrogen atoms does the preceding and subsequent member differ? (by one carbon and two hydrogen atoms or CH<sub>2</sub>)
- 3) What is the functional group in the organic acid? (COOH)
- 4) What is the functional group in aldehyde? (CHO)
- 5) If PROPANOL is an alcohol, what is PROPANAL? (Aldehyde)
- 6) How many carbon, hydrogen and chlorine atoms are present in Trichloromethane? (Carbon atom=1, Hydrogen atom=1, Chlorine atom=3)
- 7) In Organic Compounds, what is family of related compounds called if they show difference by definite unit? (Homologous series)
- 8) What is the name given for ability of an atom to combine with its own type? (Catenation)
- 9) What the name given to compounds having same molecular formula but different structural formula? (Isomers)
- 10) What is the name of the alcohol in alcoholic drinks? (Ethanol or ethyl alcohol)
- 11) What is the name given to liquor, which is poisonous? (Spurious)
- 12) What is the full form of IUPAC? (International Union of Pure and Applied Chemistry)
- 13) What is C<sub>3</sub>H<sub>7</sub> called? (Propyl radical)
- 14) What is the product if methane is burnt in excess amount of air? (Carbon Dioxide and Water)
- 15) What is the product if methane is burnt in limited supply of air? (Carbon monoxide and water)
- 16) Give the molecular formula of monochloroethane. (C<sub>2</sub>H<sub>5</sub>Cl)
- 17) What is the name for C<sub>3</sub>H<sub>7</sub>OH? (Propanol or Propyl alcohol)
- 18) How many chlorine atoms are present in carbon tetrachloride? (4 chlorine atoms)
- 19) How many bonds are between carbon atoms in ETHYLENE? (Two bonds)
- 20) If ethyl alcohol is passed over dry alumina at 240°C, what is the product formed? (Diethyl ether or ether)
- 21) If ethyl alcohol is passed over dry alumina at 300°C, what is the product formed? (ETHYLENE)
- 22) If ethyl alcohol is heated with concentrated sulphuric acid, what are the products obtained? (Ether/ diethyl ether)
- 23) What gas is produced when sodium acetate and soda lime is heated? (Methane)
- 24) How many hydroxyl groups are present in glycerol? (Three hydroxyl groups)
- 25) How many atoms of carbon, hydrogen and oxygen are in Sucrose? (Carbon=12, Hydrogen=22, Oxygen=11)
- 26) How would you separate the mixture of Sodium chloride and Ammonium chloride? (SUBLIMATION)
- 27) Which mixtures can be separated by fractional distillation? (a) Alcohol & Water (b) Water & Kerosene.
- 28) What is a solution called if it has the same composition and properties throughout? (Homogeneous)
- 29) What is a material called if it has varying composition and different properties throughout? (Heterogeneous)
- 30) What is the insoluble residue called when it settles down when a suspension is allowed to stand? (Sediment / precipitate)
- 31) State the electronic configuration of an atom with atomic number 17. (2.8.7)
- 32) State the valency of an atom with 8 electrons in its outer most orbit. (0)

- 33) Name the type of chemical combination in which some atoms lose electrons while others gain electrons to form ions. (ionic combination or electro-valent bond)
- 34) Name the kind of bond in which two atoms share a single pair of electrons. (Covalent bond)
- 35) Why is an atom electrically neutral? (It contains equal number of protons and electrons.)
- 36) What charge will an atom have if it loses an electron? (Positively charged)
- 37) What will be the electronic configuration of a non-metal with a valency 2? (2.6)
- 38) What will be the electronic configuration of a metal with a valency 3? (2.8.3)
- 39) What will be the configuration of an element in-Group 1 of the periodic table? (2.1 or 2.8.1)
- 40) Which of the following is NOT an electrovalent compound? Sodium chloride and Hydrochloric acid? (Hydrochloric acid)
- 41) Which of the following covalent molecules have a triple bond in structure? Nitrogen or Ammonia gas. (Nitrogen)
- 42) What is the valency of chlorate ( $\text{ClO}_3$ )? (1)
- 43) What is the valency of Dichromate ( $\text{Cr}_2\text{O}_7$ )? (2)
- 44) What is the valency of Lead (PLUMBOUS)? (2)
- 45) What is the name of the substance that alters the rate of a chemical reaction? (Catalyst)
- 46) What is the name of the chemical reaction when lead oxide is added to dilute nitric acid? (Neutralization)
- 47) What is the water called which has no dissolved impurities in it? (Distilled water)
- 48) What is the name of the hydrated salt used in photography? (Hypo/ Sodium thiosulphate)
- 49) What is the name of the salt that removes all types of hardness from water?(Washing soda / Sodium carbonate)
- 50) Name two substances that absorb water from the air to form a solution. (Calcium chloride or Sodium hydroxide)
- 51) What is the compound that can be used to remove temporary hardness in water but not permanent hardness? (Slaked lime or Calcium oxide or Calcium hydroxide.)
- 52) What is the name for the chemical name for scales or fur deposited on boiling water (boilers) with temporary hardness? (Calcium Carbonate)
- 53) Name the compound containing replaceable hydrogen, which can be replaced by a metal. (Any acid e.g. Hydrochloric acid, Nitric acid, Sulphuric acid or mineral acids)
- 54) Name a compound containing oxygen and hydroxide ions. (Any oxide or hydroxide of a metal)
- 55) Name the positive particle formed when acid dissolves in water. (Hydronium ion)
- 56) Which is a weak acid-Carbonic acid, Nitric acid or Hydrochloric acid. (Carbonic acid)
- 57) Which will have 1,2 or 3 electrons in the outer most orbit-metals or non-metals? (Metals)
- 58) Which will have 4,5,6 or 7 electrons in the outer most orbit-metal or non-metal? (Non metals)
- 59) What is the name given to the horizontal arrangement of elements in the periodic table? (Period )
- 60) What is the name given to the vertical arrangement of elements in the periodic table? (Groups)
- 61) Name the acidic salt. (Copper sulphate)
- 62) Name the basic salt. (Sodium Carbonate)
- 63) What happens when red and blue litmus paper is added to sodium chloride solution? (No change in colour because the solution is neutral)
- 64) What happens when red litmus paper is added to copper sulphate solution? (No change in colour because copper sulphate is acidic salt.)
- 65) What happens when a red litmus paper is added to washing soda (Sodium carbonate)? (Red colour changes to blue)
- 66) When Calcium chloride is added to sodium carbonate, what precipitate will be formed? (Calcium carbonate precipitate.)
- 67) What is a hygroscopic substance? Give examples. (A hygroscopic substance is one, which absorbs moisture but doesn't become a saturated solution. E.g. concentrated sulphuric acid or black copper oxide or paper or hair.
- 68) What is a deliquescent substance? Give examples. (A deliquescent substance is one, which absorbs moisture from the atmosphere and becomes a saturated solution. E.g. Calcium chloride, Magnesium chloride, Ferric chloride, Sodium hydroxide, Sodium nitrate.
- 69) How can you separate carbon dioxide and carbon monoxide? (By passing Carbon dioxide through Potassium hydroxide solution.)
- 70) How can you separate Ammonia gas and hydrogen gas? (By passing the mixture through water; Ammonia gas dissolves in water and hydrogen gas passes through.

## PHYSICS

- 1) What is the unit of specific heat capacity? ( $\text{J/Kg } ^\circ\text{C}$  or  $\text{Cal /g}^\circ\text{C}$ .)
- 2) What is the distance between two successive crests called? (wave length)
- 3) What is the relation between Joule and Calorie? ( $4.2 \text{ J}=1\text{Calorie}$ .)

- 4) In length, velocity and density, which one is the fundamental physical quantity? (Length)
- 5) A person, suffering from eye defect wears pair of concave glasses. What defect is he suffering from? (Myopia or short sightedness)
- 6) Define power of a lens. (Power =  $1/f$ , where  $f$  is the focal length of the lens which is expressed in meters.)
- 7) What is the unit of power of a lens? (Diopters)
- 8) If you magnetize a piece of iron and a piece of steel, which one becomes stronger magnet? (Iron)
- 9) Which one loses the magnetic property faster, Iron or steel? (Iron)
- 10) Define anode. (An electrode through which electrons leave an electrolyte)
- 11) Define cathode. (An electrode through which electrons enter an electrolyte)
- 12) If a light ray passes from glass to water, where does it bend? (Away from the normal)
- 13) What is magnification? Tell anyone mathematical relation. ( $M = \text{Image height} / \text{object height}$  or,  $\text{image distance} / \text{object distance}$ .)
- 14) If an object is in between focus and center of curvature of a convex lens, where does the image form? (Image is formed beyond center of curvature (i.e.; beyond  $2F$ ))
- 15) What type of wave is the sound wave? (Longitudinal wave)
- 16) Give two examples of transverse wave. (Light waves, water waves, string waves, radio wave, (any two))
- 17) What is the audible range of frequency? (20 Hz to 20,000 Hz)
- 18) Tell the relation between velocity, wavelength, and frequency. ( $V = f \cdot \lambda$ )
- 19) What is the SI unit of magnetic field? (Tesla)
- 20) What is the value of angle of Dip in the South Pole of the earth? ( $90^\circ$ )
- 21) What instrument is used to measure angle of Dip? (Dip Circle)
- 22) What is the net charge of an atom? (Zero)
- 23) If we rub an ebonite rod with fur, what charge is developed in the rod? (Negative)
- 24) What are the two main defects of simple cell? (Polarization and local action)
- 25) In,  $V = IR$ , what does  $R$  stand for and what is its unit? ( $R$  stands for resistance and its unit is Ohm)
- 26) Dry air is good or bad conductor? (bad conductor)
- 27) What happens to the resistance if the length of the wire is increased? (Resistance increases)
- 28) What happens to the resistance if the wire is made thinner? (Resistance increases)
- 29) If a bulb connected to 220V supply draws 0.4 Ampere current, what is the power of the bulb? (Power = 88 Watt)
- 30) Who discovered magnetic effect of current and when? (Oersted in 1820)
- 31) What is the value of density of water? ( $1 \text{ g/cc}$  or  $1000 \text{ Kg/m}^3$ )
- 32) What instrument is used to measure the density of a liquid? (Hydrometer)
- 33) What is the theory of floatation? (Weight of floating body is equal to the weight of liquid displaced by it)
- 34) What is the SI unit of pressure? ( $\text{N/m}^2$ ) or Pascal
- 35) What is the nearest star to the sun? (Proxima Centauri)
- 36) How far is Proxima Centauri from the earth? (4.3 Light years far)
- 37) What is 1 Astronomical unit (AU)? (Distance between the earth and the sun)
- 38) What is the principle of lever? (Load  $\times$  load distance = Effort  $\times$  effort distance.)
- 39) Tell a mathematical relation for Mechanical Advantage. ( $M.A. = \text{Load} / \text{Effort}$ )
- 40) When does land breeze occur (in day, evening, morning or in night)? (Night)
- 41) What are different ways of transmission of heat? (Conduction, Convection and Radiation)
- 42) Light is partially transmitted through paper. What type of material is paper called? (Translucent material)
- 43) If an element has same atomic number but different mass number, what do we say for it? (Isotopes)
- 44) What is the name of the smallest physical constant known so far? (Planck's constant)
- 45) What is the charge of an electron? (About  $1.6 \times 10^{-19}$  Coulomb)
- 46) What is moment of a force? (Force multiplied by perpendicular distance from the pivot)
- 47) What elements have been used to make the prototype of 1m long rod and 1 Kg mass which are kept at the International Bureau of Standard and measurement near Paris? (Platinum and Iridium)
- 48) What is the unit of Conductance? (mho)
- 49) Where do we get infrared radiation from? (Warm or hot objects, the sun.)
- 50) What unit is used to measure the intensity of sound? (Decibel (dB))
- 51) How many times is the intensity of sound of 30 dB greater than the intensity of sound of 20 dB? (10 times)
- 52) What is the unit of luminous intensity? (Candela)
- 53) What is the other name used for moment? (Torque)
- 54) Who discovered Neutron? (Sir James Chadwick, in 1932)
- 55) Who discovered electron? (Sir J.J. Thomson in 1897)

- 56) What is gold leaf electroscope used for? (For detecting electric charges)
- 57) What color does mixing Blue and Yellow colour of light produce? (White)
- 58) What material is used as the heating element of a heater? (Nichrome)
- 59) Nichrome is an alloy of two elements. What are those elements? (Nickel and Chromium)
- 60) What element is used as the filament of a bulb? (Tungsten)

## **TECHNOLOGY**

1. What kind of bracket is used to close HTML tags? – Angular brackets
2. Which button do we press to reload a webpage? – Refresh button
3. Which domain name does an educational institution has? - .edu
4. Which material is used in Integrated Circuit? – silicon
5. What is the full form of SDLC? – System development life cycle
6. How many components are used in DHTML? – 4
7. What is the full form of TCP/IP? –Transmission Control Protocol/ Internet protocol
8. What is the technical word for a link in webpage? – Hyperlink'
9. Which term is used for set of rules using online behavior? – Netiquette
10. Who introduced WWW? – Tim Berner's Lee
11. When was first edition of Photoshop released? – 1990 February
12. What was the first feature length animated movie? – Toy Story
13. Who replaced Ball mouse with laser mouse? – Bill English
14. How many e-mails are send over Internet per minute? -204 million
15. Who introduced computer ethics as a field of study? – Professor Norbert Wiener
16. Which sector is mostly using cloud computing? – Banking sector
17. What is the small and logical part of program called? – Module
18. Which statement is used to declare an array? –DIM
19. How much miles is used underwater for extending internet? – 550000 miles
20. What is the full form of QBASIC? - Quick Beginner's All Purpose Symbolic Instruction Code
21. What type of process creates a smaller file that is faster to transfer over the Internet? – Compression
22. Which memory is fastest memory? – Cache memory
23. For what purpose are file extensions are used? – Identify the file type
24. What is the technical term used for processed data? – Information
25. The service for allowing voice conversations through internet is called? – Internet telephony