SCIENCE

Reg. No | | | | | | | | | | | |

Time: ***2 Hours***
Max. ***Marks: 100***

Name of the student: ..... Div: .....

Name of the school : .....

Instructions:

- *All questions are compulsory.*
- *Each question carries 1 mark.*
- *Choose the most appropriate answer from the given options.*
- *Use the OMR sheet provided to mark your answers.*

1. Which of the following is a fundamental physical quantity?

A) Velocity
B) Force
C) Mass
D) Density

2. The dimensional formula for 'Force' is:

A) $[MLT^{-2}]$
B) $[ML^2T^{-2}]$
C) $[MLT^{-1}]$
D) $[LT^{-2}]$

3. The rate of change of displacement is known as:

A) Speed
B) Acceleration
C) Velocity
D) Momentum

4. Newton's First Law of Motion is also known as the Law of:

A) Action-Reaction
B) Momentum
C) Inertia
D) Gravitation

5. The area under a velocity-time graph represents the:

A) Acceleration
B) Instantaneous velocity
C) Displacement
D) Total force acting on the body

6. Work is said to be done by a force when:

A) The force is very large.
B) The body moves in a circular path.
C) The force causes a displacement in its direction.
D) The body is very heavy.

7. The SI unit of 'Energy' is:

A) Newton
B) Pascal
C) Watt
D) Joule

8. Which of the following is an example of a scalar quantity?

A) Displacement
B) Velocity
C) Acceleration
D) Distance

9. The value of acceleration due to gravity (g) on the surface of the Earth is approximately:

A) 9.8 cm/s^2
B) 9.8 m/s^2
C) 980 m/s^2
D) 0.98 m/s^2

10. The energy possessed by a body by virtue of its position or configuration is called:

A) Kinetic Energy
B) Potential Energy
C) Chemical Energy
D) Heat Energy

11. According to Newton's Third Law of Motion, for every action, there is:

A) A greater reaction
B) A smaller reaction
C) An equal and opposite reaction
D) No reaction at all

12. The SI unit of 'Pressure' is:

A) Newton
B) Joule
C) Watt
D) Pascal

13. The slope of a distance-time graph for a body in uniform motion is equal to its:

A) Acceleration
B) Speed
C) Displacement
D) Force

14. The 'center of mass' of a uniform rod is located at its:

A) End point
B) Geometric center
C) A point one-fourth from one end
D) A point outside the rod

15. The universal law of gravitation was formulated by:

A) Galileo Galilei
B) Johannes Kepler
C) Isaac Newton
D) Albert Einstein

16. A vector quantity has:

A) Only magnitude
B) Only direction
C) Both magnitude and direction
D) Neither magnitude nor direction

17. If the net external force on a system of particles is zero, the _____ of the system remains constant.

A) Velocity
B) Acceleration
C) Linear momentum
D) Kinetic energy

18. The smallest particle of an element that can take part in a chemical reaction is the:

A) Molecule
B) Atom
C) Ion
D) Compound

19. The SI unit for the 'amount of substance' is the:

A) Gram
B) Kilogram
C) Mole
D) Litre

20. The atomic number of an element is equal to the number of:

A) Neutrons in its nucleus
B) Protons in its nucleus
C) Protons and neutrons in its nucleus
D) Electrons in its outermost shell

21. Which of the following is a noble gas?

A) Nitrogen
B) Oxygen
C) Fluorine
D) Argon

22. The atomic number of Carbon is 6. Its electronic configuration is:

A) 2, 4
B) 1, 5
C) 4, 2
D) 3, 3

23. The atomic theory, which stated that all matter is composed of atoms, was first proposed by:

A) J.J. Thomson
B) Ernest Rutherford
C) John Dalton
D) Niels Bohr

24. The nucleus of an atom contains:

A) Only protons
B) Only neutrons
C) Protons and neutrons
D) Protons, neutrons, and electrons

25. The chemical formula for water is:

A) H_2O_2
B) HO
C) H_2O
D) H_3O

26. A solution with a pH value of 7 is considered:

A) Acidic
B) Basic (Alkaline)
C) Neutral
D) Highly reactive

27. The process by which a solid changes directly into a gaseous state without passing through the liquid state is called:

A) Evaporation
B) Condensation
C) Sublimation
D) Melting

28. A 'covalent bond' is formed by the:

A) Transfer of electrons from one atom to another.
B) Sharing of electrons between atoms.
C) Attraction between positive and negative ions.
D) Presence of a sea of delocalized electrons.

29. The element with the electronic configuration 2, 8, 1 is:

A) Magnesium
B) Sodium
C) Potassium
D) Lithium

30. The 'Law of Conservation of Mass' states that in a chemical reaction:

A) Mass can be created but not destroyed.
B) Mass is neither created nor destroyed.
C) The mass of the products is always greater than the mass of the reactants.
D) The mass of the reactants is always greater than the mass of the products.

31. At Standard Temperature and Pressure (STP), one mole of any ideal gas occupies a volume of:

A) 11.2 Litres
B) 22.4 Litres
C) 22.7 Litres
D) 1.0 Litre

32. Acids are substances that, when dissolved in water, produce:

A) Hydroxide ions (OH^-)
B) Hydrogen ions (H^+)
C) Oxide ions (O^{2-})
D) Sodium ions (Na^+)

33. Isotopes of an element have the same number of protons but a different number of:

A) Electrons
B) Neutrons
C) Valence electrons
D) Energy levels

34. The number of molecules in one mole of a substance is given by Avogadro's number, which is approximately:

A) 6.022×10^{20}
B) 6.022×10^{23}
C) 6.022×10^{-23}
D) 6.022×10^{21}

35. The 'cell' is considered the basic structural and functional unit of life because:

A) All living organisms are composed of cells.
B) It is the smallest unit that can carry out all life processes.
C) New cells arise from pre-existing cells.
D) All of the above.

36. The 'Cell Theory' was proposed by:

A) Watson and Crick
B) Schleiden and Schwann
C) Robert Hooke
D) Charles Darwin

37. The 'powerhouse of the cell', responsible for cellular respiration and ATP production, is the:

A) Nucleus
B) Ribosome
C) Mitochondrion
D) Chloroplast

38. The primary function of Red Blood Cells (RBCs) in the human body is to:

A) Fight infection
B) Transport oxygen
C) Help in blood clotting
D) Digest nutrients

39. The 'nervous system' in animals is responsible for:

A) Transporting nutrients and oxygen.
B) Breaking down food.
C) Coordination and control of body activities.
D) Providing structural support to the body.

40. The heart is the central organ of which body system?

A) Respiratory system
B) Digestive system
C) Nervous system
D) Circulatory system

41. The largest organ of the human body is the:

A) Liver
B) Brain
C) Skin
D) Heart

42. 'Tendons' are connective tissues that connect:

A) Bone to bone
B) Muscle to bone
C) Nerve to muscle
D) Skin to muscle

43. The basic unit of the nervous system is the:

A) Nephron
B) Alveolus
C) Neuron
D) Sarcomere

44. The process of breaking down complex food substances into simpler, absorbable forms is called:

A) Respiration
B) Circulation
C) Excretion
D) Digestion

45. The green pigment in plants that is essential for photosynthesis is:

A) Carotene
B) Xanthophyll
C) Chlorophyll
D) Anthocyanin

46. 'Photosynthesis' is the process by which green plants:

A) Release energy from food.
B) Use sunlight, water, and carbon dioxide to create their own food.
C) Absorb water and minerals from the soil.
D) Release water vapor from their leaves.

47. In vascular plants, 'xylem' tissue is responsible for the transport of:

A) Food (sugars)
B) Water and minerals
C) Hormones
D) Waste products

48. 'Transpiration' is the loss of water from plants in the form of:

A) Liquid droplets
B) Water vapor
C) Ice crystals
D) Sap

49. The reproductive part of a flowering plant is the:

A) Root
B) Stem
C) Leaf
D) Flower

50. The 'stomata' on a plant's leaves are microscopic pores that are primarily involved in:

A) Absorbing sunlight
B) Transporting water
C) Gas exchange
D) Storing food

51. He said, "I will go tomorrow." The correct indirect speech is:

A) He said that he would go tomorrow.
B) He said that he will go the next day.
C) He said that he would go the next day.
D) He said that he goes the next day.

52. Identify the grammatically correct sentence:

A) Each of the students have completed their work.
B) Each of the students has completed his or her work.
C) Each of the student have completed their work.
D) All of the students has completed his work.

53. The antonym of "lucid" is:

A) Clear
B) Bright
C) Obscure
D) Simple

54. Find the odd one out in the context of the scientific method:

A) Hypothesis
B) Observation
C) Experiment
D) Illusion

55. Which of the following arguments is deductively valid?

A) All birds have wings. A bat has wings. Therefore, a bat is a bird.
B) All mammals are warm-blooded. A whale is a mammal. Therefore, a whale is warm-blooded.
C) Some students are hardworking. Sita is hardworking. Therefore, Sita is a student.
D) If it rains, the ground gets wet. The ground is wet. Therefore, it has rained.

56. Choose the correct spelling:

A) Accomodate
B) Acommodate
C) Accommodate
D) Acomodete

57. A one-word substitution for "a person who knows everything" is:

A) Omnipotent (all-powerful)
B) Omnipresent (present everywhere)
C) Omniscient
D) Genius

58. "Brevity" is the quality of being:

A) Strong
B) Bright
C) Concise and exact in the use of words
D) Brave

59. The prefix 'un-' in the word "unpredictable" means:

A) Before
B) Not
C) After
D) Again

60. They are writing an essay. The correct passive voice is:

A) An essay was written by them.
B) An essay is written by them.
C) An essay is being written by them.
D) An essay has been written by them.

61. He is good ____ mathematics. The correct preposition is:

A) in
B) at
C) on
D) with

62. Choose the most logical conclusion: All roses are flowers. Some flowers are red. Therefore:

A) All roses are red.
B) Some roses are red.
C) No roses are red.
D) A valid conclusion cannot be drawn.

63. The statement "This is a fact because everyone believes it" is an example of which logical fallacy?

A) Ad Hominem
B) Appeal to Popularity (Bandwagon)
C) Slippery Slope
D) Hasty Generalization

64. The primary aim of analytical writing is to:

A) Entertain the reader with a story.
B) Persuade the reader through emotional appeals.
C) Present a logical argument based on evidence and analysis.
D) Describe a personal experience in detail.

65. Identify the correctly punctuated sentence:

A) What a pleasant surprise it is!
B) What a pleasant surprise it is.
C) What a pleasant surprise it is?
D) What a pleasant surprise, it is.

66. A synonym for "meticulous" is:

A) Careless
B) Indifferent
C) Thorough
D) Hasty

67. Choose the sentence with the correct use of an article:

A) He is an honest man.
B) He is a honest man.
C) He is the honest man.
D) He is an most honest man.

68. The reasoning that moves from specific observations to a general conclusion is called:

A) Deductive reasoning
B) Inductive reasoning
C) Abductive reasoning
D) Circular reasoning

69. In formal communication, it is important to be:

A) Vague and ambiguous
B) Clear, concise, and professional
C) Overly emotional and personal
D) Sarcastic and humorous

70. "The wind whispered secrets through the trees." This sentence contains an example of:

A) Simile
B) Metaphor
C) Personification
D) Hyperbole

71. 'Emotional Intelligence' in a professional context primarily involves:

A) The ability to solve complex mathematical problems.
B) Understanding and managing one's own emotions and recognizing them in others.
C) Suppressing all emotions to appear strong.
D) Having a high IQ (Intelligence Quotient).

72. 'Adaptability' is a crucial life skill that refers to the ability to:

A) Resist all forms of change.
B) Adjust to new conditions and challenges.
C) Follow a rigid and unchanging routine.
D) Avoid any situation that involves uncertainty.

73. 'Integrity' in the workplace means:

A) Always agreeing with your superiors.
B) Adhering to strong moral and ethical principles.
C) Focusing only on personal gain.
D) Being the most popular person in the office.

74. Effective 'time management' involves:

A) Avoiding breaks to work for longer hours.
B) Prioritizing tasks, setting goals, and avoiding procrastination.
C) Doing the easiest tasks first, regardless of their importance.
D) Multitasking on several important projects at once.

75. 'Peer review' in a scientific career is the process of:

A) Having friends review your work for spelling errors.
B) Having a work evaluated by other experts in the same field.
C) Reviewing the work of your peers to find faults.
D) Publishing research without any external evaluation.

76. A student who is curious, logical, and enjoys conducting experiments might be well-suited for a career in:

A) Sales and Marketing
B) Scientific Research
C) Professional Sports
D) The Performing Arts

77. 'Critical thinking' is the skill of:

A) Criticizing others' ideas without providing any reasons.
B) Accepting information without questioning its validity.
C) Objectively analyzing and evaluating information to form a judgment.
D) Memorizing a large number of facts and figures.

78. A key aspect of being a good team player is:

A) Trying to do all the work by yourself.
B) Communicating effectively and collaborating with others.
C) Taking credit for the entire team's success.
D) Avoiding any responsibility for the team's failures.

79. 'Problem-solving' as a life skill involves:

A) Ignoring problems until they go away.
B) Blaming others for the problem.
C) Identifying the problem, evaluating options, and implementing a solution.
D) Waiting for someone else to solve the problem for you.

80. A 'growth mindset' is the belief that:

A) Your intelligence and abilities are fixed and cannot be changed.
B) Your abilities can be developed through dedication and hard work.
C) Success should come easily, without any effort.
D) Challenges and failures should be avoided at all costs.

81. Complete the analogy: Cube is to Square as Sphere is to:

A) Circle
B) Point
C) Line
D) Cylinder

82. Find the next term in the series: 2, 6, 12, 20, 30, ?

A) 40
B) 42
C) 44
D) 36

83. Analogy: Photon is to Light as Phonon is to:

A) Heat
B) Electricity
C) Sound
D) Magnetism

84. If ACEG is to BDFH, then GIKM is to:

A) HJLN
B) HKLN
C) HJKM
D) IJLM

85. Find the next term in the series: A1, B4, C9, D16, ?

A) E20
B) F25
C) E25
D) F20

86. Analogy: Neuron is to Nerve as Bit is to:

A) Software
B) Circuit
C) Code
D) Byte

87. Find the next term in the series: 3, 9, 27, 81, 243, ?

A) 486
B) 656
C) 729
D) 999

88. Find the odd one out:

A) DNA
B) RNA
C) Protein
D) Carbohydrate

89. If CAT = 24 (C=3, A=1, T=20; sum), then DOG = ?

A) 25
B) 26
C) 27
D) 28

90. Analogy: Atom is to Electron as Solar System is to:

A) Galaxy
B) Planet
C) Sun
D) Star

91. India's successful Chandrayaan-3 mission, widely reported in late 2023, achieved a historic soft landing on the:

A) Surface of Mars
B) North pole of the Moon
C) South pole of the Moon
D) An asteroid near Earth

92. The 2024 Nobel Prize in Physics, as highlighted in Avenir magazines, was awarded for experimental methods that generate:

A) Gravitational waves
B) Attosecond pulses of light for studying electron dynamics in matter
C) High-temperature superconductors
D) A deeper understanding of black holes

93. If you witness a small, contained fire in a science laboratory, the most appropriate first action is to:

A) Run out of the building immediately.
B) Try to extinguish it with a fire extinguisher, if you are trained and it is safe to do so, while alerting the instructor.
C) Take a video of the fire on your phone.
D) Ignore it and continue with your experiment.

94. The term 'herd immunity', which became prominent during the COVID-19 pandemic, refers to a situation where:

A) A disease is completely eradicated from the world.
B) A large portion of a community becomes immune to a disease, making its spread unlikely.
C) Only the strongest individuals in a population survive a disease.
D) A government mandates a complete lockdown of the country.

95. A biotech company has to decide between investing in research for a rare disease that affects a small population or a common ailment that affects millions. An ethical decision based on social justice would likely involve:

A) Focusing only on the common ailment as it offers a larger market.
B) Considering ways to fund the rare disease research, as those patients have fewer options.
C) Avoiding both to focus on more profitable ventures.
D) Letting the government make the decision.

96. A significant increase in a country's production of 'green hydrogen' is a key strategy to:

A) Increase its dependence on imported fossil fuels.
B) Combat climate change by reducing carbon emissions.
C) Promote the use of coal-fired power plants.
D) Expand its nuclear weapons program.

97. As a student, you find a well-researched article online that supports your project, but you cannot find the author's credentials. The most responsible decision is to:

A) Use the information and present it as your own.
B) Use the information but try to cross-verify it with other credible, authoritative sources.
C) Discard the article immediately because the author is unknown.
D) Share the article widely on social media.

98. The 'Gaganyaan' mission, a major undertaking by ISRO, is India's first:

A) Mission to Mars
B) Human spaceflight mission
C) Mission to study the Sun
D) Interstellar mission

99. A government is faced with a decision to build a new dam that will provide electricity to thousands but will displace a tribal community. This situation presents a conflict between:

A) Economic development and social justice/environmental concerns.
B) Science and religion.
C) National security and international relations.
D) Agriculture and industry.

100. The concept of 'sustainable development', a key theme in global summits like COP29, aims to:

A) Achieve rapid economic growth at any environmental cost.
B) Meet the needs of the present without compromising the ability of future generations to meet their own needs.
C) Preserve the environment by stopping all industrial development.
D) Focus only on the economic development of rich countries.