Question Bank

For

Class - 9

Chapter - 1

System of Measurements & Measuring Devices

(CLASS-9B)

MEASUREMENT

(Multiple choice questions) (MCQ)

1) How many fundamental physical quantities are present in the derived physical quantity momentum?
(a) Two (b) Three (c) four

2) Which of the following is the largest unit for measurement of length?
(a) ligth year (b) parsec (c) Kilometre (d) metre

3) Smallest distance that can be measured by an ordinary scale is
(a) 0.1cm (b) 0.01cm (c) 0.001 cm (d) 0.2 cm

4) Density of a substance -
(i) $\frac{\text{Volume}}{\text{Mass}}$ (ii) $\frac{\text{Mass}}{\text{Volume}}$ (iii) Mass x volume (iv) $\frac{\text{Mass}}{\text{Area}}$

5) Which of the following quantities is not a physical quantity?
(a) length (b) force (c) water (d) time

6) The physical quantity which is measured by a common balance is
(a) Volume (b) mass (c) weight (d) force

7) Which of the following is a large unit used for the measurement of mass
(a) Kilogram (b) quintal (c) Carat (d) gram

8) Which of the following systems has seven base units?
(a) CGS system (b) MKS System (c) FPS System (d) SI System

9) Which of the following unit is not a fundamental unit?
(a) Metre (b) litre (c) Second (d) Kilogramme

10) The fundamental unit of mass in SI system is ..
(a) ✓Kilogram (b) meter (c) gram (d) newton

(Group-B)
(very short questions)

1) What are the types of physical quantities?
2) Mention some direct methods to measure length?
3) Which is the instrument used to measure small mass like that of an atom.
4) What are the fundamental units in CGS system?
5) What is the largest unit for measurement of length?
6) Which instrument is used to measure the mass of body
7) What is the CGS unit of thrust?
8) Mention the largest unit of time?
9) Mention some direct methods to measure length?
10) What is the largest practical unit of mass?

(Group-C)
(short questions)

1) What is a physical quantity? Give some examples
2) Why CGS system or SI is called metric system?
3) What are the advantages of the metric system?
4) Define unit of length in SI
5) Define unit of mass in SI
6) Define unit of time in SI
7) What are the units of volume in CGS system and SI? Write the relationship between these two unit.
8) How many base units are there is SI System?
9) Give the basic units of length in CGS / MKS / SI System
10) Give the basic units of mass in CGS / MKS / SI System

(Group-D)
(Long questions)

1) How will you measure the thickness of a paper with help of a normal scale

2) How do you measure the length of a curved line with the help of a thread and an ordinary scale.

3) How do you measure the thickness of a page of a book with the help of an ordinary scale?

4) If the density of mercury is 13.6 g/cm^3 in CGS, what is its density in CGS? of mercury in SI?

5) If the density of iron in SI is 7800 Kg/m^3, what is its density in CGS?

6) Name the SI unit of density. How is it related to g cm^{-3}

7) The density of aluminium is 2.7 g cm^3. Express it in Kg m^{-3}

8) What is used to measure long distances?

9) Describe the precautions required while measuring length

10) How do you measure the diameter of a wire with the help of an ordinary scale?

Chapter - 2

Force & Motion including Newton's Laws of Motion

(Force and Motion)

(GROUP-A)

(Multiple choice questions) (MCQ)

1) Dimensional formula of velocity is
(a) LT^{-1} (b) LT^{-2} (c) LT (d) MLT^{-1}

2) Compared to a light body, inertia of a heavy body is
(a) more (b) less (c) same (d) not possible to determine

3) Unit of acceleration in CGS system is
(a) $m \cdot s^{-1}$ (b) $cm \cdot s^{-2}$ (c) $m \cdot s^{-2}$ (d) $cm \cdot s^{-1}$

4) Which of the following is at absolute rest?
(a) earth (b) Sun (c) moon (d) none of these

5) Dimensional formula of acceleration is
(a) LT^{-1} (b) LT^{-2} (c) LT^{-3} (d) $L^{-1}T$

6) Which law of motion of Newton defines force?
(a) first law of motion
(b) second law of motion
(c) third law of motion
(d) law of gravitation

7) Ratio of traversed distance and displacement of a moving body is:
(a) < 1 (b) ≤ 1 (c) ≥ 1 (d) $= 1$

8) Amount of force acting on a body of mass 1Kg moving with an acceleration of $1 m \cdot s^{-2}$ is
(a) 1dyn (b) 1N (c) 5dyn (d) 10N

9) If a force of 50 dyn acts on a body of mass 10g, its acceleration is
(a) $3 cm \cdot s^{-2}$ (b) $7 cm \cdot s^{-2}$ (c) $8 cm \cdot s^{-2}$ (d) $5 cm \cdot s^{-2}$

10) A boy walks 3Km eastwards and then 4Km northwards. Displacement of the boy is
(a) 10Km (b) 5Km (c) 8Km (D) 14Km

(Group - B)
(Very short type questions)

1) Imagining the earth as a point with respect to sun, what type of motion does the earth undergo around the sun?
2) What type of motion does a rotating body undergo around its own axis?
3) The direction of displacement is considered in which way?
4) Two bodies of masses 5 Kg and 6 Kg are falling from rest without any resistance. Which one has more acceleration?
5) What type of motion is the motion of a merry-go-round?
6) Can the distance traversed by a moving particle be zero?
7) What is the force due to which it is difficult to push a body on the ground?
8) What type of motion is the motion of an arm of a clock?
9) What type of motion is the motion freely falling body?
10) What type of motion is the motion of a merry-go-round?

(Group - C)
(Short type questions)

1) What do you understand by rest and motion?
2) All rest and motion are relative - explain
3) How many types of motion a body may passes? What are those types?
4) What do you understand by rotational motion? Explain with examples
5) What is translational motion? Explain with examples.
6) Write down the differences between translational motion and rotational motion.

7) What is compound motion? Give example.
8) Diurnal and annual motion of the earth fall under which category
9) What do you understand by periodic motion? Give examples
10) What is displacement? What type of quantity is it?

(Group-D)
(Long type questions)

1) What do you mean by uniform circular motion?
2) What do you mean by acceleration?
3) Establish the equation $v^2 = u^2 + 2as$ by algebraic method.
4) The equation $s = ut + \frac{1}{2}at^2 + s0$ signifies what type of motion?
5) Establish the equation $v = u + at$ with the help of velocity-time graph.
6) Establish the relationship $s = \bar{v}t$ by using velocity-time graph.
7) Draw the displacement-time graph of a particle moving with uniform velocity. What is the nature of this graph?
8) Draw the displacement-time graph of a particle moving with uniform acceleration. What is the nature of this line graph?
9) Write down your concept of effective force in brief.
10) Write down Newton's third law of motion and explain it.

Chapter - 3

Pressure of Liquid & Air.

PRESSURE OF LIQUID AND AIR

GROUP-A

(Multiple choice questions) (MCQ)

1) SI unit of pressure is-
(a) Pascal (b) Dyne (c) Watt (d) None of these

2) In SI system unit of one pascal is-
(a) Dyne/cm2 (b) ~~n/m²~~ n/m2 (c) cal/g(d) c

3) ----- is used to measure atmospheric pressure
(a) thermometer (b) Speedometer (c) odometer (d) barometer

4) Atmospheric pressure is usually expressed in terms of-
(a) mercury column (b) water column c) both a and b (d) none of the

5) The Principle of barometer depends on-
a) Archimedes principle (b) Newton's law (c) Pascal's law (d) none

6) The gradual fall of barometric height gives an indication of-
(a) rain (b) Strom (c) both a and b (d) none of these

7) Liquid exert ---------- in all direction.
(a) Pressure (b) thrust (c) buoyant force (d) all of these

8) ------ of a substance is the mass of the substance per unit volume.
(a) force (b) area c) density (d) velocity

9) Greater the density of the fluid ------ is the buoyant force.
(a) greater (b) lower (c) 0 (d) none of these

10) A piece of wax ------ on water
(a) immersed (b) sink (c) floats (d) none of these

(Group-B)
(Fill in the blanks)

1) The weight or force action on the whole area of a surface is called ----------

2) Liquid has ------- pressure which increase with depth.

3) Thrust = ---------

4) --------- is named after the province of Artois in France.

5) In --------- liquid, body experiences greater ~~bbo~~ buoyant force.

6) A body is --------- while floating

7) Density = ---------

8) Thrust is a --------- quantity

9) The free surface of liquid, at rest is always ---------

10) The weight acting on the whole area of a surface is called ---------

(Group-C)

(Numerical :-)

1) A block of 36cc ice floats on water. What volume of it remain above water surface?

2) If the barometer reading at a place be 74.5 cm find the pressure per square centimetre.

3) A solid weighs 50N. It is immersed in water and the weight of it in water is 45N. Find the relative density of the solid

(Give reasons)

1) An iron ball sinks in water while a ship made of iron floats on water.

2) A floats body is weightless

3) Ice floats in water

4) A ~~sled~~ steady rise in barometer reading gives the indication of clear and fair weather

(Short answer type questions:-)

1) Define Artesian well
2) What is Archimedes principle?
3) On what factor buoyancy depends?

(Group-D)

(Long question answers:-)

1) Explain the salient features of upthrust
2) Explain the measurement of atmospheric pressure by Torricelli.
3) Explain the transport of liquid by siphon and the condition of working siphon.
4) Explain how water is supplied in city.
5) Explain - Liquid has lateral pressure which increases with depth. Explain with help of an experiment.
6) Explain the three possible relation between weight and buoyant force
7) Why is a dam of water reservoir thicker at the base than at the top?
8) Explain the characteristics of a floating body.
9) Explain - the upper free surface of a liquid at rest is horizontal. Explain with the help of a experiment.
10) A ship sinks in river water than in sea water - why?

(SURFAC TENSION:-)

(GROUP-A)

(Multiple choice questions) (MCQ)

1) The value of Surface Tension of a Liquid at critical temperature
(a) Zero (b) Infinit (c) between 0 and ∞ (d) cannot be determine

2) Surface tension is due to
(a) Frictional forces between molecules
(b) Cohesive forces between molecules
(c) Adhesive forces between molecules
(d) Gravitional forces between molecules

3) When there is no external force, the shape of a liquid drop is
(a) Surface tension of a Liquid
(b) Density of a Liquid
(c) Viscosity of Liquid
(d) Temperature of air only

4) A pin or needle floats on the surface of water, the reason for this is
(a) Surface tension (b) Less weight (c) Upthrust of Liquid (d) None of the above

5) If temperature increases, the surface tension of a Liquid.
(a) Increases (b) Decreases (c) Remains the same (d) Increases then Decreases.

(Group-B)

(True & false)

1) Soap helps in cleaning clothes, because it lowers the surface tension of the solution-

2) Coating used on raincoat are waterproof because water is not scattered away the coating-

3) Hairs of shaving brush cling together when it is removed from water due to the fore of attraction between hair-

4) Water does not wet an oily glass because oil repels water.

5) A liquid surface comes at rest after stirring due to surface tension.

(One word Answers:)

1) The temperature at which the surface tension of water is zero.

2) The dimensions of a surface tension are.

3) Raindrops are spherical in shape because of what?

4) The surface of the water in contact with the glass wall is.

5) Common salt is dissolved in water, then the surface tension of sea water will be.

(Fill in the blanks:)

1) _____ acts on the free surface of a liquid.

2) Surface tension acts _____ on the free surface

3) Surface tension of _____ is greater than that of soil.

4) The unit of surface tension is _____

5) Surface tension is a _____ as it has no specific direction.

(Group-C)

(Short Answer Questions:)

1) Write some factors effects on surface tension?

2) What is surface tension?

3) What are the factors of surface tension?

4) What are the applications of surface tension?

5) What is the general formula of surface tension?

6) What liquids have the strongest surface tension?

7) Does salt reduce surface tension?

8) Why do we measure surface tension?

9) What type of force is surface tension?

10) What has the most surface tension and why?

(Group-D)

(Long type Question Answers:-)

1) Explain 3 phenomenon related to surface Tension?
2) Show the activity of film of a soap solution?
3) Write the molecular theory of surface Tension?
4) With the help of an example prove that the force due to surface tension in the backward direction becomes greater than that in the forward direction. And how; if a dirty clothes are washed with pure and clean water, grease and stains are not clearly removed?
5) Solve the problems:
   (i) The surface Tension of water is 12/dyne. Convert it in SI unit
   (ii) A wooden stick 2m long is floating on the surface of water. The tension of water is 0.07 N/m. By putting soap solution on one side of the stick, the surface tension is reduced to 0.06 N/m. The net force on the stick will be how much.

(Viscosity)

(Group-A)

(Multiple choice questions) (MCQ)

1) Which of the following represents viscosity?
(a) Potential energy stored in fluid
(b) Resistance to fluid motion
(c) Roughness of the surface
(d) The pressure difference between too liquids.

2) Which of these fluids has the highest viscosity?
(a) Water (b) Honey (c) Blood (d) Air.

3) What happens to the viscosity liquid with the increase in temperature
(a) It increases (b) It decreases (c) It may increase or decrease (d) No change.

4) What do we call the maximum velocity of a fluid in a tube for which the flow remains streamlined.
(a) Hyper velocity (b) Critical velocity (c) stream velocity (d) Laminar velocity.

5) What is the SI unit of viscosity?
a - Candela (b) Poiseuille (c) Newton/m (d) No units

(Group-B)

(Fill in the blanks:-)

1) Honey is more viscous than _____, _____ is more viscous than honey.

2) Viscosity help in the selection of good _____

3) Unit of viscosity is _____

4) On increasing the temperature the viscosity of the fluid. _____

5) _____ of different _____ is different

(True/false:-)

1) A chocolate bar is a good example of viscosity-
2) All liquids have the same viscosity-
3) A liquids with high viscosity will flow slowly-
4) Honey has a greater viscosity than vinegar-
5) The resistance of a liquid to flow is known as viscosity-

One word Answers:-

1) The Newton's Law of viscosity is not applicable to-
2) Dimension of viscosity-
3) What happens to viscosity on increasing the pressure-
4) Tiny rain drops have radius as small as how much cm-
5) What is the cgs unit of dynamic viscosity-

(Group-C)

(Short type Answer Question:)

1) What things affects viscosity?
2) What is viscosity in simple statement?
3) What is the SI unit of viscosity?
4) How is viscosity calculated?
5) What are the examples of viscosity?
6) What are the types of viscosity?
7) What is the C.G.S unit of viscosity?
8) How is viscosity used in real life?
9) Where is viscosity important?
10) What is the cause of viscosity of liquid?

(Group-D)

(Long Answer/questions:-)

1) What is viscosity grade? What is oil viscosity index? Does oil viscosity increase with temperature? what is a good viscosity index? How do we read viscosity index?
2) What is the formula for viscous force?

3) What are the properties of Dynamic viscosity or velocity with the help of fluid passing from two parallel plates.

4) Describe the points and different units of kinematic and extensional ~~vet viscos~~ viscosity? what is viscosity. Index and its co-efficient.

5) Give Reasons for:

(i) Is water viscous

(ii) Does honey has high or low viscosity.

(iii) Does density is directly proportional to viscosity?

(iv) Does air have viscosity?

(v) Is high viscosity is thick or thin?

(CLASS-9)

(ELASTICITY)

(Multiple choice questions) (MCQ)

(Group-A)

1) What is the value of stress within certain limit of elasticity
(a) Zero (b) Proportional to strain (c) inversely proportional to strain (d) Does not depend upon strain

2) Elasticity of a substance will — with increase of temperature
(a) decrease (b) increase (c) decrease and then increase (d) remain same.

3) Which of the following substances has the greatest elasticity?
(a) Sponge (b) Copper (c) rubber (d) steel

4) The formula we use to find stress is
(a) area/force (b) force/area (c) force + area (d) force x area

5) The unit of strain is
(a) newton (b) joule (c) Pascal (d) no unit

6) A comparison of such a change caused by the stress with the original shape, volume or length is called.
(a) Stress (b) Strain (c) density (d) elasticity

7) If elastic limit of a material is 10N, then highest limit of the applied force upto which this material behaves like a ~~pe~~ perfectly elastic materials is.
(a) 5N (b) 10N (c) 15N (d) 20N

8) A body is said to be perfectly elastic if
(a) it can move freely (b) it is not effected by external force
(c) it ~~is not effected by~~ recovers its original shape/size when the deforming force is removed.
(d) its surface is perfectly smooth.

9) If a body does not suffer any strain under any amount of stress, the body is called.
(a) a perfectly elastic body (b) a perfectly rigid body (c) a plastic body (d) none of the above

10) Within elastic limit stress is
(a) zero (b) proportional to strain (c) does not depend upon strain (d) inversely proportional to strain

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(Group-B)
(Very short questions)

1) How does a body behave upto its elastic limit?

2) If there is no strain of a body due to an external balanced force of any magnitude, what do we call the body?

3) In between stress and strain, which one is fundamental?

4) Stress is not fundamental but strain is fundamental. why?

5) What is the dimensional formula of young's modulus?

7) Does liquid and gaseous materials have young's modulus?

8) Glass is more elastic than rubber - why?

9) Which one is more fundamental - stress or strain?

10) What is elastic after effect?

(Group-C)
(Short question answers)

1) When a load of 25 Kg is attached to a wire of diameter 0.4 cm, the strain produced is 2%. Find the young's modulus of the material of the wire.

2) Are the values of young's modulus for a thin and a thick iron wire of the same length different?

3) What is elasticity?

4) What are the properties of elasticity?

5) What is stress? What is the unit of stress?
6) What is Hooke's law? what is the SI unit of Hooke's law
7) What is the SI unit of young modolus?
8) What do you mean by Brittleness? Write example?
9) By which items we can identify that it is a Ductility?
10) How can we depends upon the Kind of stress used to Pr oduce the stown?

(Group-D)
(Long questions)

1) State what is the work of spring Constant?
2) Explain with brief about the longitudinal strain?
3) What are the properties of matter? Explain them with example
4) Explain with brief steel is more elastic than rubber?
5) Write down the difference between strain and stress?
6) Explain in brief why spring Constant is also called Springless Constant of the Spring?
7) A wira 2m long and 2mm in diameter, when stretched by weight of 8kg has its length increased by 0.24mm. Find the stress strain and young's modolus of the material of the wira $g = 9.8 m/s^2$
8) ~~A wire of length 2m and cross-se~~ A concrete has a heig- ht of 5 meters and has unit area of $3 m^3$ Supports a ma ss of 90,000 kg. Determine (a) The stress (b) The strain (c) The change in height! Acceleration due to gravity (d) $10 m/s^2$ young modulus of concrete $= 20 \times 10^9 N/m^2$
9) A string as diameter of 1cm and the original of 2m the string is pulled by a force of 200N. Determine change in the length of the string young's modulus of the string $= 5 \times 10^9 N/m^2$

10) A wire of length 2 m and cross-sechonal area $10^{-4} m^2$ is stretched by a load 10^2 Kg. The wire is stretched by 0.1cm Calculate latitudinal stress, longitudinal strain and young modolus of the material wire.

chapter-4

Matter: Atomic Structure, the Physical & Chemical Properties of the Matter

(Atomic structure)

(Group-A)

(Multiple choice Questions:-)

1) The constituent particle of cathode rays is
(a) electron (b) proton (c) neutron (d) ion.

2) Which of the following is not a fundamental particle of matter?
(a) electron (b) proton (c) positron (d) neutron

3) The heaviest particle of an atom is
(a) neutron (b) proton (c) electron (d) positron

4) Which metal plate was used in Rutherford's α-scattering experiment?
(a) aluminium (b) gold (c) silver (d) zinc

5) Which of the following elements is an α-particle emitter?
(a) radium (b) iron (c) lead (d) bismuth

6) ${}_{1}^{2}H$ and ${}_{2}^{3}H$ are
(a) isotopes (b) isobars (c) isotones (d) none of these

7) The nucleus of ordinary hydrogen atom is known as
(a) neutron (b) positron (c) proton (d) meson

8) A neutron is heavier than an electron by
(a) 1839 times (b) 1836 times (c) 1857 times (d) 1957 times

9) The lowest energy state of an atom is known as its
(a) ground state (b) equilibrium state (c) excited state (d) stationary state

~~10) A neutron is heavier than an elec~~

10) The mass of a neutron is almost equal to mass of an/a
(a) electron (b) proton (c) nucleus (d) helium atom

(Group-B)
(Very short type questions)

1) Who discovered electrons?
2) What is the magnitude of $\frac{e}{m}$ (charge/mass) of a neutron?
3) What is the diameter of an atom?
4) Who discovered radioactivity?
5) Give an example of electromagnetic radiation.
6) Who discovered neutrons?
7) Who coined the term neutron?
8) What is the mass of an electron?
9) What is the mass of a proton?
10) What is the mass of an neutron?

(Group-C)
(Short type questions)

1) How is cathode ray produced in an electric discharge tube?
2) Why is electron considered as a fundamental particle of an atom?
3) How is anode ray produced in an electric discharge tube?
4) Mention the similarities between a proton and an electron?
5) Why is an atom electrically neutral?
6) Which observation led to the discovery of neutrons in an atom?
7) What is a nuclide? Give example
8) What is meant by ground state and excited state of an atom?
9) What is the relation between atomic number and mass number of an atom?
10) How do atoms absorb or release energy?

(Group - D)

(Long Answer type questions)

1) State three important characteristics of cathode rays
2) How was the existence of protons detected in anode rays?
3) Between proton and electron, which particle has a higher e/m value and why?
4) Describe the watermelon model of an atom.
5) Describe Rutherford's atomic model.
6) Mention the different characteristics of nuclear force.
7) What is nuclear force? How does this force originate?
8) What is Bohr - Bury scheme?
9) What are the different characteristic features of isotopes?
10) Write the different between an atom and an ion.

(Concept of Mole)

(Group - A)

(Multiple choice questions) (MCQ)

1) The meaning of the Latin word 'moles' is
(a) many (b) having large volume (c) having large mass (d) heap

2) The word 'mole' was first used by
(a) Dalton (b) Ostwald (c) Avogadro (d) Millikan

3) The value of Avogadro's number is
(a) 6.024×10^{20} (b) 0.6023×10^{22} (c) 0.6022×10^{24} (d) 0.623×10^{23}

4) Number of molecules in 36 g water is
(a) mole (b) gram-mole (c) gram-atom (d) gram-ion

5) Amount of $Ca(OH)_2$ required to produce 1 mol of OH^- ions is
(a) 74g (b) 148g (c) 37g (d) 60g

6) 1amu is equal to
(a) 1.66×10^{-24} Kg (b) 1.66×10^{-25} g (c) 0.166×10^{-23} g (d) 1.66×10^{-20} g

7) The formula mass of $MgCl_2$ (Mg = 24) is
(a) 95 u (b) 65 u (c) 85 u (d) 75 u

8) 117 g NaCl is equal to how many gram-formula mass of NaCl?
(a) 1 (b) 2 (c) 3 (d) 4

9) The mass of 1 atom of $^{35}_{17}Cl$ is
(a) 17 u (b) 34 u (c) 35 u (d) 70 u

10) Molar mass of sulphuric acid is
(a) 98 Kg mol^{-1} (b) 98 g mol^{-1} (c) 49 u (d) 49 mg mol^{-1}

(Group-B)
(Very short type questions)

1) Who determined the value of Avogadro's number
2) What is the unit of molar mass?
3) What is the SI unit of quantity of matter?
4) How many H-atoms are present in 1 mol hydrogen gas?
5) 1U = how many grams?
6) How many Fe-atoms does 1 gram-atom of iron indicate?
7) How many grams of CO_2 does 1 gram-mole of CO_2 indicate?
8) How many grams of H_2O does do 1 gram-mole of H_2O indicate?
9) Find the actual mass of one atom of $^{16}_{8}O$
10) What is the mass of one molecule of water (H_2O) in amu?

(Group-C)
(Short type questions)

1) Define mole
2) '1 mole of a human being' - is the expression scientifically correct?
3) What is Avogadro's number?
4) What is Avogadro's constant? How different from Avogadro's number?
5) What is gram-atomic mass?
6) What is gram-atom?
7) What is gram-molar mass?
8) What is gram-molecule or gram mole?
9) How many gram-atoms and gram moles of oxygen are present in 32g oxygen
10) What is atomic mass unit?

(Group-D)
(Long type questions)

1) Avogadro's number creates a correlation between the macroscopic and microscopic world-explain.

2) Show that, 1 gram-mole of any substance contains the same number of molecules.

3) Do 1 mol O_2 and 1 mol O represent the same quantity of oxygen?

4) Write the differences between atomic mass and mass of an atom of an elements.

5) Why is the atomic mass of most of the elements fractional?

6) How does the volume of a gas change with temperature at a constant pressure?

7) How does the volume of a gas change with pressure at a constant temperature?

8) Find the number of molecules in 1L water. (Given: density of water = $1 g mL^{-1}$)

9) How many grams of H_2SO_4 are required to produce 1 gram-ion of H^+?

10) Find the mass of 1 molecule of CO_2

(CLASS-9)

(ACIDS, BASES AND SALTS)

(Multiple choise questions) (MCQ)

(Group-A)

1) Which one of the following salts does not contain water of crystallisation:
(a) Blue vitriol (b) Baking soda (c) Washing soda (d) Gypsum

2) Which metal reacts with caustic soda produce H_2 gas?
(a) Cu (b) Al (c) Fe (d) All of them

3) A covalent compound whose aqueous solution is acidic is
(a) CH_4 (b) CCl_4 (c) HCl (d) NH_3

4) An organic compound whose aqueous solution is acidic is
(a) C_2H_6 (b) C_6H_6 (c) CH_4 (d) CH_3COOH

5) An indicator which shows pink colour in alkaline solution is
(a) litmus (b) methyl orange (c) phenolphthalein (d) methyl red.

6) In neutral solution, the colour of methyl red indicator is
(a) red (b) blue (c) yellow (d) orange

7) Which of the following is used to prepare soaps and and detergents?
(a) HNO_3 (b) HCl (c) H_2SO_4 (d) NaOH

8) Sulphuric acid reacts with bicarbonate salts to produce
(a) NO_2 (b) SO_2 (c) CO_2 (d) CO

9) Which of the following is not a mineral acid?
(a) hydrochloric acid (b) citric acid (c) Sulphuric acid (d) nitric acid.

10) For which of the following solutions, PH will be maximum
(a) 1 mol L^{-1} HCl solution
(b) 0.1 mol L^{-1} HCl solution
(c) 0.1 mol L^{-1} HCl solution
(d) 0.001 mol L^{-1} HCl solution

(Group - B)
(Very short questions)

1) What is Arrhenius famous for?
2) Name a base which is not a metallic oxide or hydroxide?
3) Name some ~~metallic~~ metallic oxides which exhibit acidic property?
4) Can BCl_3 be considered as an acid according to Arrhenius theory?
5) How do indicators indicate the end point of an acid-base neutralisation reaction.
6) What is the colour of litmus in neutral solution?
7) Name an indicator which exhibits orange colour in neutral solution.
8) Name the acid which is used in the preparation of HCl (g)
9) Which acid is used in the preparation of inorganic fertiliser, ammonium sulphate?
10) Which acid reacts with sodium hydroxide to produce table salt?

(Group-C)
(Short questions).

1) Why do free H^+ ions not exist in water or aqueous solution?

2) Define acid in the light of Arrhenius theory of electrolytic dissociation?

3) Sodium hydroxide ($NaOH$) is a base, but $ClOH$ is an acid. Why?

4) State whether $Al(OH)_3$ is a base or an alkali. Justify your choice

5) The brown ring formed in the ring test disappears when the test tube is shaken. Why?

6) Concentrated sodium hydroxide ($NaOH$) solution should not be boiled in aluminium vessels. Why?

7) Acids are not stored in metal containers. Explain

8) Under what condition does Cu react with HCl? Give equation.

9) What do you mean by acid burns and alkali burns?

10) What are the steps that should be immediately taken in case of an acid burn or an alkali burn.

(Group-D)
(Long questions)

1) Mention the limitations of Arrhenius acid-base concept.

2) All acids are hydrogen-containing compounds, but all hydrogen-containing compounds are not acids justify the statement with example.

3) All alkalis are bases, but all bases are not alkalis explain.

4) HCl gas is not an acid, but aqueous solution of HCl is strongly acidic. Why?

5) How is an indicator chosen for an acid-base neutralisation reaction

6) Mention some uses of nitric acid in industries.

7) What is milk of magnesia? Write its uses and side effects.

8) What are the major causes for which the acidity of agricultural lands increases.

9) Discuss the uses and side effects of aluminium hydroxide as antacid

10) Discuss the uses and side effects of sodium bicarbonate as antacid.

(SEPARATION OF THE COMPONENTS OF MIXTURE)

(Group-A)

(Multiple choice questions)

1) Which of the following is not a compound?
(a) benzene (b) water (c) Petroleum (d) toluene

2) During fractional distillation of crude petroleum into its constituents, petrol distils at -
(a) 70°c (b) 120°c (c) 250°c (d) 400°c

3) Which of the following is a homogeneous mixture?
(a) water and oil (b) water and alcohol (c) water and sand (d) water and benzene

4) A fractionating column is used for the process of
(a) filtration (b) distillation (c) vapourisation (d) fractional distillation

5) The component of petroleum which is not used as a fuel is
(a) petrol (b) naphtha (c) Kerosene (d) diesel

6) Which of the following is required in solvent extraction method
(a) filter paper (b) funnel (c) Separatory funnel (d) beaker

7) Benzene and nitrobenzene can be separated from their mixture by
(a) fractional distillation (b) filtration (c) Simple distillation (d) Sublimation

8) The boiling point of water at Darjeeling will be
(a) more than 100°c (b) less than 100°c (c) equal to 100°c (d) Cannot be determined.

9) During fractional distillation of crude petroleum into its constituents, petrol distils at
(a) 70°c (b) 120°c (c) 250°c (d) 400°c

10) A salt can be extracted from its aqueous solution by (a) sublimation (b) filtration (c) distillation (d) fractional distillation.

(Group-B)
(Very short type questions)

1) Give an example of a homogeneous mixture.
2) Is it possible to separate the constituents of petroleum by distillation?
3) Which process is suitable to separate water and Kerosene from their mixture?
4) What is the basis of separation of the components of crude petroleum?
5) What is the boiling point of rectified spirit which is an azeotropic mixture?
6) How can a mixture of sand and iron dust be separated?
7) Which process is suitable to separate acetone and methanol from their mixture?
8) Which process is used in the refining of crude Petroleum
9) When is fractional distillation used for separating the components of mixture
10) State whether fractional distillation is a physical or chemical process?

(Group-C)
(Short type questions)

1) Why is it necessary to separate the components of a mixture?
2) What is distillation
3) What is fractional distillation
4) Which type of mixture are separated by distillation?
5) What is fractional distillation?

6) State two important application of fracti
7) What is a homogeneous mixture? Give example
8) Write the differences between homogeneous mixture and compound?
9) What are the limitation of fractional distillation?
10) Two immiscible liquids, water and kerosene are kept in a beaker for some time. Which liquid will from the lower layer?

(Group-D)
(Long type question)

1) Under which conditions, fractionals distillation is used instead of simple distillation?
2) How is the boiling point of a liquid related to the pressure above its surface? Write important applications of this property.
3) Is it possible to boil water at room temperature
4) Give two examples where separatory funnel is used to separate the components of a mixture.
5) The components of which type of mixture can be separated by using separatory funnel?
6) Is it possible to separate water and alcohol from their mixture with the help of a separatory funnel?
7) Why is it necessary to separate the components of petroleum?
8) Show how the gaseous components of air are separated with the help of a flowchart.
9) State the working principle of distilation?
10) State the working principle of fractionating column?

(Water)

(Group-A)

(Multiple choice Questions) (MCQ)

1) In SI unit, the specific heat of water is
(a) 4200 $JKg^{-1}K^{-1}$ (b) 2100 $JKg^{-1}K^{-1}$ (c) 6300 $JKg^{-1}K^{-1}$ (d) 4500 $JKg^{-1}K^{-1}$

2) Water is a
(a) non-polar solvent (b) polar solvent (c) organic solvent (d) none of these

3) An organic compound that dissolves in water is
(a) benzene (b) alcohol (c) wax (d) carbon tetrachloride

4) An inorganic compound that does not dissolve in water is
(a) Sodium chloride (b) Potassium nitrate (c) Calcium carbonate (d) Zinc sulphate

5) The tendency of a liquid to flow against gravity in a narrow tube is called-
(a) surface tension (b) viscosity (c) capillary action (d) none of these

6) The hardness of water can be of
(a) 4 types (b) 3 types (c) 2 types (d) 5 types

7) A salt responsible for permanent hardness of water is
(a) $CaCl_2$ (b) $Ca(HCO_3)_2$ (c) NaCl (d) Na_2CO_3

8) If acid (H^+) is added to water, then water will behave as
(a) soft water (b) hard water (c) pure water (d) deionised water.

9) The type of water used in boilers of factories is
(a) soft water (b) hard water (c) deionised water (d) germ-free water.

10) Degree of hardness of water is measured in
(a) gl^{-1} (b) $molL^{-1}$ (c) ppm (d) KgL^{-1}

(Group-B)
(Very short type questions)

1) At what temperature, the density of water is maximum?
2) Which halogen is used for the purification of water?
3) What must be the coliform count of drinking water?
4) What is the value of dielectric constant of water?
5) Name two metals that react with water at room temperature
6) Name a salt which causes temporary hardness in water?
7) Name a fatty acid from which soap is prepared?
8) Name a pesticide that causes water pollution?
9) Name a halogen whose water soluble salts cause water pollution?
10) What is meant by the statement - 'Specific heat of water is $1 cal\, g^{-1} {}^{\circ}C^{-1}$'?

(Group-C)
(Short type questions)

1) Why is water called a universal solvent?
2) Why is water called a polar solvent?
3) What property of water makes it excellent for fermentation?
4) What are the essential criteria of drinking water?
5) Mention one practical application of high specific heat of water
6) Mention the limitations of purification of water by boiling.
7) What do you mean by temporary hardness of water?
8) What do you mean by permanent hardness of water?

9) How is the degree of hardness of water expressed?
10) What will be the harmful effects if excess chloride salts are present in drinking water?

(Group-D)
(Long type questions)

1) Discuss how detergents cause water pollution?
2) Discuss how pesticides cause water pollution?
3) How do nitrate fertilisers cause water pollution?
4) Mention three major causes of water pollution?
5) What are detergents? What is the advantage of using detergents in hard water?
6) How does the pH value of water affect our health?
7) Discuss how fertilisers cause water pollution?
8) How is dissolved fluoride salts removed from water?
9) What are the limitations of purification of water by UV-rays?
10) Mention the advantages of purification of water by UV-rays

Solution

Group-A

Multiple choice questions

1) The Brownian motion of colloidal particles indicates
(a) linear motion (b) circular motion (c) spiral motion (d) random motion.

2) Which of the following is an emulsion?
(a) Curd (b) milk (c) milk of magnesia (d) soda water

3) Milk is a type of
(a) gel (b) foam (c) oil-in-water type emulsion (d) water-in-oil type emulsion

4) Unit of solubility is
(a) $g\ cm^{-3}$ (b) $kg\ m^{-3}$ (c) g (d) unitless

5) An example of an amorphous solid is
(a) Sugar (b) Salt (c) glass (d) blue vitriol

6) An example of a crystalline solid is
(a) glass (b) wax (c) pitch (d) common salt

7) An example of lyophilic sol is
(a) gold sol (b) silver sol (c) sulphur sol (d) starch sol

8) An inorganic solvent except water is
(a) chloroform (b) kerosene (c) liquid ammonia (d) ethyl alcohol

9) An example of an organic solvent is
(a) water (b) liquid ammonia (c) acetone (d) liquid SO_2

10) An example of a lyophobic sol is
(a) ferric hydroxide sol
(b) starch sol
(c) gelatin
(d) soap

Group-B
Very short type questions

1) Name a Colloidal solution which is used in our daily life
2) How can a suspension be prepared?
3) Give some examples of emulsion?
4) What is meant by gel?
5) Name some Covalent Compounds which are soluble in water?
6) Name a water soluble organic Compound?
7) What is the unit of solubility?
8) Which substance acts as the emulsifying agent in milk
9) Give some examples of hydrophilic colloids?
10) Give some examples of hydrophobic colloids?

Group-C
Short type questions

1) What is a solution?
2) What is a suspension?
3) What is a Colloidal solution?
4) What is an emulsion? Give suitable example?
5) Define ~~Solubility~~ Solubility?
6) Write some uses of methyl alcohol as a solvent?
7) What is diffusion?
8) Write some uses of Kerosene as a solvent?
9) Write some uses of Chloroform as a solvent?
10) Write some uses of acetone as a solvent?

Group-D
Long type questions

1) Discuss the properties of a true solution?
2) How will you prepare colloidal sulphur?
3) State the properties of a suspension?
4) State the important properties of a colloidal solution?
5) Discuss the significance of Brownian motion?
6) State some important applications of emulsions.
7) Classify emulsions and define each of them with examples
8) State the significance of solubility curve
9) 60g NaOH is dissolved in 500 mL water. Express the Conc. of the solution in $mol L^{-1}$
10) 1.575g oxalic acid is dissolved in 250 mL water. find the Conc. of the solution in gL^{-1} and % W/V.

Chapter - 5

Work, Power & Energy

(Work, Power and Energy)

(GROUP-A)

(Multiple choice questions)

1) Unit of work in SI is
(a) Watt (b) erg (c) joule (d) dyne

2) Energy is
(a) the rate doing water (b) the capacity of doing work (c) the power of doing work (d) all of the above.

3) A physical quantity whose value can never be negative is
(a) work (b) power (c) kinetic energy (d) potential energy

4) Dimensional formula of work is
(a) MLT^{-2} (b) ML^2T^{-3} (c) ML^2T^2 (d) MLT^{-3}

5) Dimensional formula of power is
(a) MLT^{-3} (b) ML^2T^3 (c) ML^2T^{-2} (d) ML^2T^{-3}

6) Unit of power in CGS system is
(a) J/S (b) erg/s (c) watt (d) erg·s

7) Kinetic energy of a moving object of mass 2 Kg is 16 J. Its momentum is
(a) $2 Kg \cdot m \cdot S^{-1}$ (b) $4 Kg \cdot m S^{-1}$ (c) $8 Kg \cdot m \cdot S^{-1}$ (d) $12 Kg \cdot m \cdot S^{-1}$

8) Which of the following physical quantities has joule/hour as its unit?
(a) work (b) kinetic energy (c) force (d) power.

9) Example of no-work force is
(a) frictional force (b) centripetal (c) surface tension (d) all of the above

10) Unit of energy in SI is
(a) newton (b) erg (c) watt (d) joule

(Group-B)
(Very short type questions)

1) Give an example of no-work force.
2) Give an example of a Conservative energy
3) 1kg.m = how many J?
4) 1 J = how many erg?
5) What is the unit of power in SI?
6) What is the absolute unit of work in SI?
7) What is the absolute unit of work in CGS system?
8) 1 horsepower = how many w?
9) What is the dimensional formula of Kinetic energy?
10) 1 Kw.h = how many J?

(Group-C)
(Short type questions)

1) Define work. How is the quantity of work measured?
2) What is no-work force? Give two examples of no-work force?
3) What do you mean by work done by a force or positive work? Explain with examples.
4) Define power. What is the definition of power?
5) Define absolute unit of power in CGS system and SI
6) Name different forms of energy
7) Can the Kinetic energy of a body be negative? Explain
8) Give an example of the potential energy of a body due to change of its position
9) Give an example of the potential energy of a body due to change of its shape

10) Can gravitational potential energy be negative?

(Group - D)
(Long type questions)

1) Write and explain the law of conservation of mechanical energy
2) Establish the law of conservation of mechanical energy for a freely falling body
3) A body of mass 10kg is raised upward by 5m. Calculate the work done
4) A body is displaced 2m in the direction of an applied force of 400 dyn. Calculate the work done.
5) A motor car is running on a horizontal road with uniform velocity. Is the engine of the car doing work in this conditions?
6) The power of an engine is 5 ~~hore~~ horsepower. What do you mean by the above statement?
7) What is the relationship between power and velocity
8) What is the dimensional formula of power? What are the dimensions of power?
9) Explain elastic potential energy and gravitational potential energy with examples.
10) What is gravitational potential energy? Develop a formula for gravitational potential energy.

chapter-6

Heat

(HEAT)

(Group-A)

(Multiple chasie questions) (MCQ)

1) Heat lost by the hot bodies = Heat gained by the cold bodies. Is the principle of-
(a) Calorimetry (b) Newton's law (c) Archimedes principle (d) none

2) Heat which changes the temperature of a body is called---
(a) radiant heat (b) latent heat (c) sensible heat (d) none

3) 1 Calorie of heat
(a) 4.2 J approx (b) 2.4 J approx (c) 4.189 J (d) both a and c

4) Which substance has the highest specific heat value.
(a) hydrogen (b) water (c) brass (d) aluminium

5) Latent heat of ice is-
(a) 336 cal/g (b) 336000 cal/g (c) 80 cal/g (d) none

6) The anomalous expansion of water takes place in between-
(a) 0 c to 4c (b) 0c to -4c (c) -4c to 4c (d) none

7) Heat =
(a) m·s·t (b) m·t (c) m·s (d) none

8) The heat energy involved in a change of state is called-
(a) radiant heat (b) latent heat (c) sensible heat (d) none

9) A gas or vapour cools when it suddenly --------
(a) expands (b) decrease (c) both (d) none

10) Heat which comes to us from a source such as sun is called
(a) radiant heat (b) Latent heat (c) Sensible heat (d) none.

(Group-B)

(Fill up:-)

1) Latent heat of boiling of steam --------
2) The quantity which is measurable by thermometer is ------
3) At ------- volume of water is minimum and its density is maximum.
4) Specific heat of water is --------
5) -------- of a body is the amount of heat required to raise the temperature.
6) In CGS system, water equivalent of the body is --------
7) SI unit of heat ------
8) The heat responsible for the change of phase of matter is called the -------- heat.
9) Melting and -------- are reversible transitions.
10) The temperature at which a certain volume of air is saturated with the water vapour present it is known as --------

(Group-C)

Numerical:-

1) Find the quantity of heat required to convert 15g water at 100c to 15g steam at 100c [Specific latent heat of vapourisation of water = 22·6 10 to the power 5 J/Kg]
2) How many calories of heat will be evolved on expenditure of 84J of energy?
3) A lump of copper of mass 100g is cooled from 60c to 40c. How much heat will be rejected by the lump? Specific heat of copper = 0·09 cal/g/c.
4) (Give reason:-)
1) Ice is a better colling agent than water even if both are at 0c?
2) Latent heat of vapourisation protects plant from wilting in summer.

9) Why does steam at 100c cause more injury on skin than water at 100c

(Short answer type questions :-)

1) What is latent heat?
2) What is Mechanical equivalent of heat? Write the relationship.
3) How anamolous expansion of water helps to preserve aquatic life?
4) What is humidity?

(Group-D)

(Long question answer :-)

1) Explain the fundamental principle of calorimetry
2) Explain Saturated vapour and unsaturated vapour
3) Explain heating and cooling curve.
4) Water has a high specific heat. Why is this useful when it is used as a coolant in engines?
5) Different between sensible heat and latent heat.
6) Explain dew and fog.
7) On a certain winter day the dew points inside and outside that the room are the same. Yet the relative humidities are different. Explain.
8) Why is there a difference of temperature between water at the bottom and top of a waterfall?
9) Water is powred into a hole made in a block of melting ice. will the added water freeze.
10) On heating. When the chemical properties of substance changes?

chapter - 7

Sound

(Sound)
(Group-A)
(Multiple choice questions)(MCQ)

1) The sound can travel in air when:
(a) Particles of medium travel from one place to another
(b) There is no moisture in the atmosphere
(c) Disturbance travel from one place to another.
(d) Both particles as well as disturbance travel from one place to another.

2) Which part of human ear converts sounds vibrations into electrical signals.
(a) Hammer (b) Stirrup (c) Tympanic membrane (d) Cochlea.

3) What do dolphins, bats and porpoise use
(a) ultrasound (b) Infrasound (c) Both a and b (d) None of these

4) Children under the age of 5 can hear upto
(a) 25 HZ, (b) 25K HZ (c) 20HZ (d) 25K HZ

5) Reverberation of sound is used in
(a) Stethoscope (b) Trumpets (c) Megaphone (d) All of these

6) Speed of sound depend upon
Temperature of the medium
Pressure of the medium
Temperature of source producing sound
Temperature and pressure of medium

7) Loud sound can travel a larger distance, due to
(a) Higher amplitude (b) Higher energy (c) High frequency (d) High speed

8) Eardrum is a part of
(a) Sound producing organ
(b) Skeleton system
(c) Hearing organ
(d) Reproductive organ

9) The voice box is called
(a) Stomach (b) Heart (c) Larynx d - Mouth

10) The pitch of sound depends on
(a) frequency (b) Amplitude (c) both of these (d) None of these

(Group-B)

(Fill up the blanks :-)

1) Sound is a kind of ------
2) Sound propagates maximum in ------
3) Pitch is the sensation of the -------- of an emitted sound.
4) Sound ~~de~~ needs a ------- medium for propagation:
5) A soft board will ------- most of the sound falling on it.

(One word Answers :-)

1) Noise is produced by -
2) Unwanted sound is called -
3) The unit of frequency is -
4) What is the sound of single frequency -
5) The sound of earthquake is what kind of sound -

(True / false :-)

1) Light travels at a speed of 4×10^8 m/s
2) Sound is produced by vibrations -
3) Sound travels faster than light -
4) M^{-1} is the unit of frequency -
5) Sound requires a medium for propagation -

(Group-C)
(Short Answer type Question:-)

1) Enumerate the differences between musical sound and noise
2) Explain how defects in a metal block can be detected using ultrasound.
3) How is ultrasound used for cleaning?
4) Give two practical application of reflection of sound wave.
5) What is reverberation? How can it be reduced.

(Group-D)
(Long Answer type Question:-)

1) Explain how a sound wave propagates through air in the form of compressions and refractions.
2) What is sonic boom?
3) The wall of a room can reflects sound waves but not light waves. On the other hand, a simple plane mirror can reflect light waves but not sound waves. Why?
4) Give reasons for:-
(i) Suppose you and your friend are on the moon. Will you be able to hear any sound produced by your friend?
(ii) Why are the ceilings of concert halls are curved?
(iii) Why can echoes not be heard in small room?
(iv) Sound is produced due to a vibratory motion, then why a vibratory pendulum produces sound.
(v) How bats use ultrasound to catch their prey.
5) Solve the numericals:-
(i) A boy stands 33 m from a cliff and claps his hand. Will he hear a distinct echo? (Give velocity of sound in air is 330 m/s).
(ii) If the velocity of sound in air be 330m/s, then how many complete vibration should be performed by a tunning

fork having frequency 520 Hz in the time taken by the emitted sound to travel a distance of 990 m?