My Revision Deck

Term Examination — Answer Key

2026 – 2027

Grade: 8 **Subject:** Physics

Time: 2½ hours **Maximum Marks:** 80

Section A

1. **Choose the correct answers to the questions from the given options. (Do not copy the questions, write the correct answers only.)**

(i) Which expression correctly gives the electrical energy supplied by a source when current I flows for time t at potential difference V? [1]

(a) W = V × I / t

(b) W = V × t / I

(c) W = V × I × t

(d) W = I × t / V

Explanation: *Since charge Q = It and W = QV, substituting gives W = V × I × t. This is the work done by the source to move charge through the conductor against the potential difference.*

(ii) Boiling is the process in which: [1]

(a) A liquid changes to vapour from its surface at all temperatures

(b) A solid changes directly to vapour at a single fixed temperature value

(c) A liquid changes to vapour throughout its bulk at a fixed temperature

(d) A vapour suddenly changes back to a liquid as it is cooled rapidly

Explanation: *Boiling is the change from the liquid state to the vapour (gaseous) state, taking place throughout the bulk of the liquid at a fixed temperature called its boiling point.*

(iii) When you stand on loose sand, your feet sink deeply, but when you lie on the same sand, you do not sink as much. Why? [1]

(a) Standing exerts a greater thrust on the sand

(b) Larger contact area gives greater pressure value

(c) Smaller contact area gives greater pressure value

(d) The total thrust is shared with the sand particles

Explanation: *The thrust exerted on the sand equals the body's weight in both cases. Standing applies that thrust on a smaller area (the feet), producing a greater effect, so the feet sink in. Lying down spreads the same thrust over a larger area, reducing the effect.*

(iv) The condensation point of steam is: [1]

(a) 0°C

(b) 55°C

(c) 100°C

(d) 78.3°C

Explanation: *The boiling point of a liquid and the condensation point of its vapour are the same. Since the boiling point of water is 100°C, the condensation point of steam is also 100°C.*

(v) When a ray of light of a single colour passes through a glass prism, it: [1]

(a) Passes straight through without deviation in its direction

(b) Is bent away from the base of the prism after refraction

(c) Is bent towards the base of the prism after refraction

(d) Splits into the seven colours of the visible spectrum

Explanation: *On passing through a prism, a ray of single colour suffers two refractions — entering the prism it bends towards the normal (rarer to denser), and on leaving it bends away from the normal (denser to rarer). The net effect is that the ray bends towards the base of the prism.*

(vi) What does the amplitude of a sound wave represent? [1]

(a) The number of waves passing a fixed point in one second of time

(b) The maximum displacement of a particle from its mean rest position

(c) The total time taken by a particle to complete one full vibration

(d) The total distance covered by a wave in one full time period of vibration

Explanation: *Amplitude is defined as the maximum displacement of a particle of the medium from its mean (rest) position on either side. It is denoted by the letter a and is measured in metres.*

(vii) Two coolies, A and B, lift the same load to the same height. Coolie A does it in 1 minute and coolie B does it in 2 minutes. Which of the following is true? [1]

(a) A and B do the same amount of work, but A spends twice the power of B because A takes less time

(b) A does double the work but spends the same power as B because the load that is lifted is the same

(c) A and B do the same work and spend the same power because the load and the height are identical

(d) B does more work than A because B takes much longer, and B also spends more power than A does

Explanation: *Both coolies do the same work because they lift the same load to the same height (force × distance is the same). But A does it in half the time, so the rate of doing work, that is the power spent, is double for A.*

(viii) An electric oven of 3 kW is used for 4 hours daily. If the cost of electricity is Rs 6.25 per kWh, what is the cost for one day? [1]

(a) Rs 25

(b) Rs 50

(c) Rs 75

(d) Rs 100

Explanation: *Energy per day = Power × Time = 3 kW × 4 h = 12 kWh. Cost = 12 × 6.25 = Rs 75.*

(ix) The S.I. unit of thrust is the same as that of: [1]

(a) Pressure

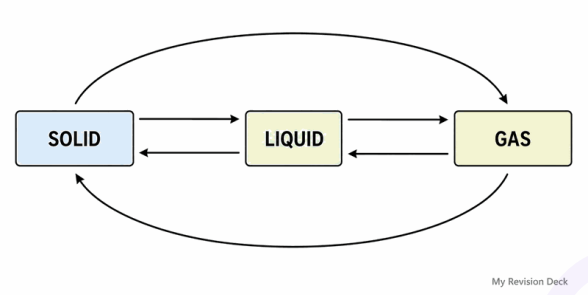
(b) Force

(c) Mass

(d) Area

Explanation: *The unit of thrust is the same as that of weight or force. Its units include kilogram force (kgf), gram force (gf) and newton (N).*

(x) Observe the diagram showing the changes of state of matter between solid, liquid and gas, with an arrow for each process. Which of the given options best names the process shown by the arrow that goes from the solid directly to the gas state? [1]

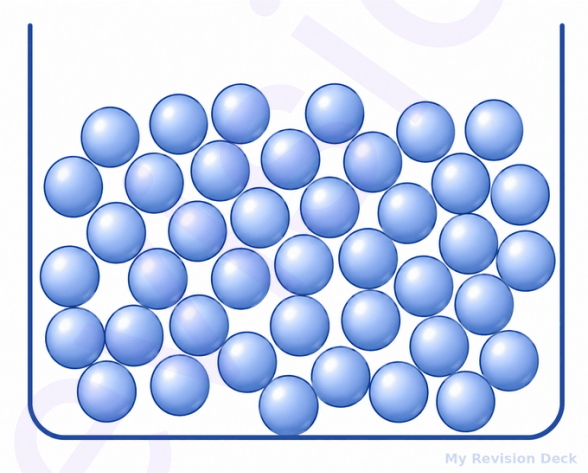


Source: MyRevisionDeck | Internal | Proprietary

(a) Melting
(b) Condensation
(c) Vaporization
(d) Sublimation

Explanation: *The arrow going directly from solid to gas represents sublimation. The substance changes directly from the solid state into the vapour state without passing through the liquid state. Camphor is an example.*

(xi) Observe the diagram. Which of the given options best describes the arrangement of molecules shown? [1]

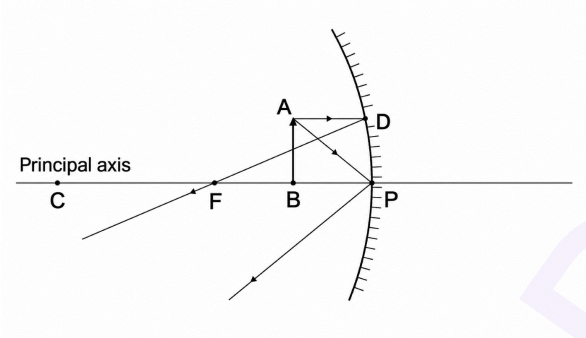


Source: MyRevisionDeck | Internal | Proprietary

(a) Molecules are less closely packed and can move within the vessel boundary
(b) Molecules are in fixed positions and very tightly packed
(c) Molecules are very wide apart with extremely weak forces of attraction
(d) Molecules are arranged in a rigid, fixed and orderly pattern

Explanation: *The diagram shows molecules arranged less closely than in a solid with some inter-molecular spaces. Their positions are not fixed — they can move within the boundary of the vessel. This is characteristic of the liquid state.*

(xii) Observe the diagram showing two rays from the tip A of an object AB placed between the principal focus F and the pole P of a concave mirror, and the rays after reflection. Which of the given options best describes the image of AB formed by the mirror? [1]



Source: MyRevisionDeck | Internal | Proprietary

(a) Real, inverted and smaller than the object placed in front of the mirror

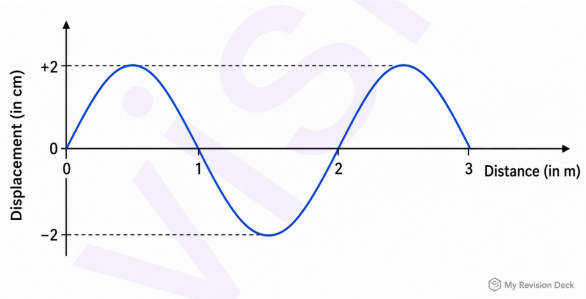
(b) Virtual, erect and larger than the object placed in front of the mirror

(c) Virtual, inverted and smaller than the object placed in front of the mirror

(d) Real, erect and of the same size as the object in front of the mirror

Explanation: *When the object is placed between the focus F and the pole P of a concave mirror, the reflected rays diverge and appear to come from a single point behind the mirror. The image so formed is virtual, erect and magnified compared to the object.*

(xiii) Observe the graph shown in the image. Which of the given options names the two physical quantities of the wave that can be obtained directly from this graph? [1]



Source: MyRevisionDeck | Internal | Proprietary

(a) The frequency of the wave and the time period of the wave from one peak to next

(b) The intensity of the wave and the speed of the wave through the air around the source

(c) The loudness of the wave and the pitch of the wave produced by the source vibrating

(d) The wavelength of the wave and the amplitude of the vibrating particle of the medium

Explanation: *A displacement-distance graph plots the displacement of particles of the medium against distance at one instant of time. The wavelength (distance between two consecutive crests) and the amplitude (maximum displacement) can therefore be read directly from it.*

(xiv) Assertion (A): When a person pushes a heavy stationary wall, no work is said to be done in the scientific sense. [1]
Reason (R): Although a force is applied on the wall, the wall does not move and so no motion is produced in the direction of the applied force.

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A

(c) A is true but R is false

(d) A is false but R is true

Explanation: *The wall does not move when the force is applied, so no motion is produced in the direction of the force and no work is done. The reason therefore correctly explains the assertion.*

(xv) Assertion (A): A lightning conductor protects a tall building from being damaged by lightning. [1]
Reason (R): When a charged cloud passes over the building, an opposite charge induced on the spikes flows safely down through the copper rod to the earth.

(a) Both A and R are true and R is the correct explanation of A

(b) Both A and R are true but R is not the correct explanation of A

(c) A is true but R is false

(d) A is false but R is true

Explanation: *A lightning conductor does protect tall buildings from lightning damage (A is true). The reason given describes exactly how this protection works — the induced charge passes safely to the earth, preventing a destructive lightning strike on the building (R correctly explains A).*

2. **(i) Complete the following by choosing the correct answers from the bracket:**

(a) In charging by induction, the near end of the conductor acquires a charge _____ in nature to that on the charging body. [opposite / similar] [1]

opposite

(b) The moment of a force is equal to the _____ of the force and its perpendicular distance from the pivoted point. [sum / product] [1]

product

(c) Hydrogen and oxygen are examples of _____ molecules. [diatomic / polyatomic] [1]

diatomic

(d) The S.I. unit of heat is the _____. [joule / kelvin] [1]

joule

(e) The apparent weight of a body floating on a liquid is _____. [zero / equal to the body's actual weight] [1]

zero

(f) A mirage is sometimes seen in _____. [deserts / forests] [1]

deserts

(ii) **Match the following:** [3]

Column A	Column B
(a) 1 mL	(i) Density of water
(b) 1000 kg m^{-3}	(ii) Same volume as 1 cm^3
(c) kg m^{-3}	(iii) SI unit of density

(a) → (ii)

(b) → (i)

(c) → (iii)

(iii) Define one joule of work. [1]

Model answer: One joule is the work done when a force of one newton moves a body through a distance of one metre in the direction of the applied force.

3. (i) An electric fuse is the simplest safety device used in a household circuit.

(a) Of which alloy is the wire of an ordinary household fuse made and what is its melting point? [1]

Model answer: The wire of an ordinary household fuse is made of an alloy of lead and tin (50% each) and its melting point is about 200°C.

(b) In which wire of a household circuit is a fuse always connected and why? [1]

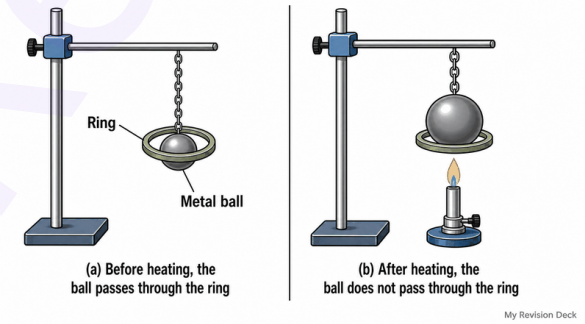
Model answer: A fuse is always connected in series with the live wire so that when it melts, the live connection is broken and the supply is disconnected from the appliance.

(ii) The weight of object A is 4 kgf and the weight of object B is 60 N. Which object is heavier, and by how much (in newton)? [2]

B, by 20 N

Model answer: To compare, express both weights in the same unit.
1 kgf = 10 N (nearly).
Weight of A = 4 kgf = 4 × 10 N = 40 N.
Weight of B = 60 N.
Difference = 60 N − 40 N = 20 N.
Object B is heavier, by 20 N. (Using 1 kgf = 9.8 N: A = 39.2 N, so B is heavier by 20.8 N.)

(iii) Study the diagram of the experimental set-up and answer the questions that follow.



Source: MyRevisionDeck | Internal

(a) What does the experiment shown in the diagram demonstrate? [1]

Model answer: The ball-and-ring experiment demonstrates that a solid expands on heating and contracts on cooling.

(b) On the basis of molecular motion, explain what happens inside the metal ball when it is heated by the burner. [1]

Model answer: On heating, the average kinetic energy of the molecules of the ball increases and they vibrate with larger amplitude about their mean positions; the inter-molecular separation therefore increases and the ball expands in all directions.

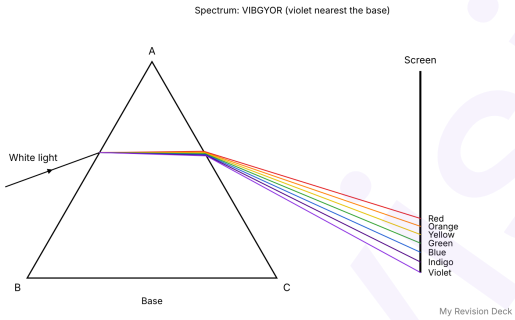
(iv) How much heat is released when 3 kg of water at 0 °C freezes into ice at 0 °C? (Specific latent heat of fusion of ice = 336 × 10^3 J kg^{-1}) [2]

1.008 × 10^6 J

Model answer: The heat released during freezing is the same as the heat absorbed during melting, for the same mass.
Formula: heat absorbed or released (Q) = mass (m) × specific latent heat (L).
Q = 3 kg × 336 × 10^3 J kg^{-1} = 1008 × 10^3 J.
Heat released = 1.008 × 10^6 J.

(v) Draw a neat labelled diagram showing the dispersion of white light by a glass prism. Label the colours of the spectrum obtained on the screen in their correct order. [2]

Model answer: The diagram shows a glass prism ABC with white light falling obliquely on the face AB. On entering the prism, the white light splits into its constituent colours, since the speed of light in glass (and so the refractive index) is different for different colours. The colours separate further on refraction at the second face AC. A band of seven colours, the spectrum, is obtained on a white screen. Starting from the side of the base of the prism, the colours are Violet, Indigo, Blue, Green, Yellow, Orange and Red (VIBGYOR). Violet deviates the most and red the least.



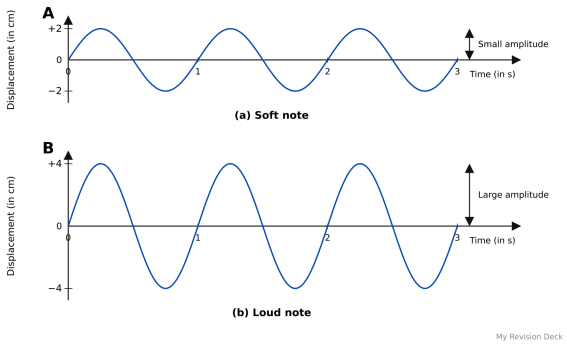
(vi) A piece of iron of mass 195 g is immersed in water taken in a Eureka can. It displaces 25 mL of water. Find the density of iron in kg m^{-3}. [3]

7800 kg m^{-3}

Model answer: Volume of iron = volume of water displaced = 25 mL = 25 cm^3.
Formula: density = mass / volume.
Density = 195 / 25 = 7.8 g cm^{-3}.
Conversion: 1 g cm^{-3} = 1000 kg m^{-3}.
Density = 7.8 × 1000 = 7800 kg m^{-3}.

(vii) Draw two displacement-time wave forms — one labelled A for a soft sound and one labelled B for a loud sound — with the same frequency. Mark the amplitudes clearly. [2]

Model answer: Two sinusoidal displacement-time wave forms are drawn one above the other on the same time axis. Both waves have the same time period (and hence the same frequency). Wave A (the soft sound) has a small amplitude, while wave B (the loud sound) has a much larger amplitude — for example, the amplitude of B is twice the amplitude of A. The amplitudes on either side of the mean (zero displacement) line are clearly marked. The time period is the same horizontal distance between successive identical points on each curve.



Section B

(Attempt any 4 questions out of 5)

4. (i) A concave mirror has a focal length of 7 cm. Calculate its radius of curvature. A second concave mirror has a radius of curvature of 50 cm. Calculate its focal length. [3]

Radius of curvature R = 14 cm; focal length of the second mirror f = 25 cm

Model answer: For a spherical mirror, the radius of curvature and focal length are related by R = 2f (equivalently f = R/2).
Given: f = 7 cm.
R = 2f = 2 × 7 = 14 cm.
Radius of curvature R = 14 cm.
Given: R = 50 cm.
f = R/2 = 50/2 = 25 cm.
Focal length f = 25 cm.

(ii) Different metals have different coefficients of linear expansion, leading to different practical uses.

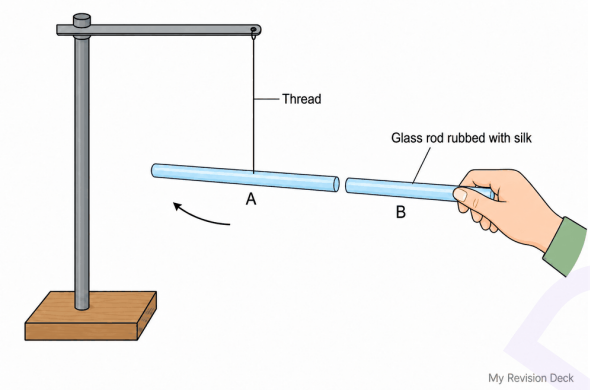
(a) Name the alloy used in the pendulum of a precision clock and the metals from which it is made. [1]

Model answer: Invar is the alloy used in the pendulum of a precision clock; it is made of iron and nickel.

(b) Why is the alloy named in the previous part especially suited for making the pendulum of a precision clock? [2]

Model answer: Invar has a negligibly small coefficient of linear expansion (about 9 × 10^{-7} per °C), so it almost does not expand on heating. Therefore the length of an invar pendulum hardly changes as the temperature changes from summer to winter. As a result, the pendulum of invar helps the clock neither to lose time in summer due to expansion nor to gain time in winter because of contraction.

(iii) Study the diagram showing two charged glass rods being brought close to each other and answer the questions that follow.



Source: MyRevisionDeck | Internal

(a) Describe what is observed in the diagram and the reason for this observation. [2]

Model answer: The diagram shows that the two glass rods, both rubbed with silk, repel each other when brought close together. The reason is that both glass rods have acquired the same kind of charge (positive) when rubbed with silk. Like charges repel each other, so the suspended glass rod moves away from the second glass rod brought near it.

(b) What would have been observed if one of the glass rods had been replaced by an ebonite rod rubbed with fur? Justify your answer. [2]

Model answer: If one of the glass rods had been replaced by an ebonite rod rubbed with fur, the suspended rod would have been attracted to the ebonite rod instead of being repelled. This is because the glass rod rubbed with silk carries a positive charge, while the ebonite rod rubbed with fur carries a negative charge — these are unlike charges, and unlike charges attract each other.

5. (i) Describe an activity in which water is added to a long test tube and air is blown across its open end. Explain how the pitch of the sound changes as more water is added. [3]

Model answer: Take a long test tube and blow gently across its open end so that the air column inside it is set into vibration. A sound of a particular pitch is heard. Now pour a little water into the test tube and blow across the open end again. The pitch of the sound is now higher. As more water is added, the air column above the water becomes shorter and shorter. A shorter air column vibrates at a higher frequency, so the pitch of the sound becomes higher with each addition of water. The activity shows that the pitch of the sound increases as the length of the vibrating air column decreases.

(ii) Change of state is an important concept in the study of matter.

(a) Why is the heat absorbed or released during a change of state called 'latent heat'? [1]

Model answer: It is called latent heat because the word 'latent' means hidden — this heat produces no change in the temperature of the substance, so it is not manifested by any observable temperature rise or fall.

(b) Define change of state and name the six change-of-state processes. [2]

Model answer: Change of state is the process by which a substance changes from one state to another, either by absorbing or by rejecting heat at a constant temperature. The six processes are melting (solid to liquid), freezing (liquid to solid), vaporization or boiling (liquid to gas), condensation (gas to liquid), sublimation (solid to gas) and deposition (gas to solid).

(iii) The kinetic energy of a body is closely connected to its mass and its speed.

(a) Define kinetic energy and give two examples of bodies that possess kinetic energy. [2]

Model answer: Kinetic energy is the energy possessed by a body by virtue of its state of motion. One example is a fast-moving stone, which breaks a window pane it strikes, and another is a falling hammer, which drives a nail into a wooden block.

(b) State the expression for the kinetic energy of a body and explain how the KE changes if the speed of the body is reduced to half its original value (with mass unchanged). [2]

Model answer: The kinetic energy of a body of mass m moving with speed v is K.E. = ½ mv^2. Since K.E. is proportional to the square of the speed, if the speed is reduced to half (v becomes v/2), the new K.E. = ½ $m(v/2)^2$ = ½ × m × $v^2/4$ = (½ mv^2) / 4. So the kinetic energy reduces to one-fourth of its original value.

6. (i) A force of 600 N acts normally on one face of a box. The area of this face is 0.3 m^2. Calculate the pressure exerted on the face in pascal, and express this pressure in kilopascal. [3]

Pressure = 2000 Pa = 2 kPa

Model answer: Given:
Thrust F = 600 N (acting normally on the face)
Area A = 0.3 m^2
Formula: Pressure P = F / A
Substitution: P = 600 N / 0.3 m^2 = 2000 N m^{-2} = 2000 Pa
In kPa: P = 2000 ÷ 1000 = 2 kPa
Therefore, the pressure exerted on the face is 2000 Pa (= 2 kPa).

(ii) The relative density of a liquid is measured using a density bottle.

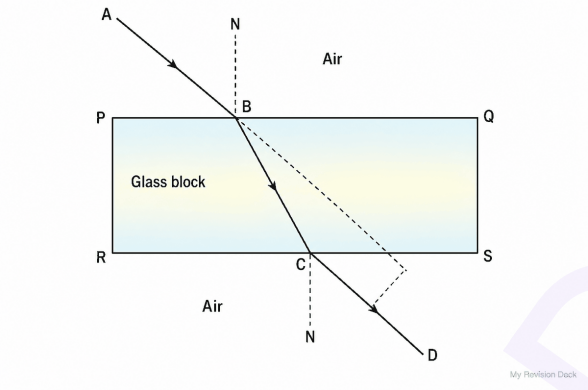
(a) By what alternative name is relative density also known, and in terms of masses, write the equivalent expression for the relative density of a substance. [1]

Model answer: Relative density is also known as specific gravity; in terms of masses it is expressed as R.D. = (mass of any volume of the substance) / (mass of an equal volume of water).

(b) Explain why relative density has no unit, and why it is numerically equal to the density of the substance when expressed in g cm^{-3}. [2]

Model answer: Relative density is the ratio of two densities — the density of the substance and the density of water. Because both quantities have the same units, the units cancel and relative density is a dimensionless number. Since the density of water is 1 g cm^{-3}, dividing the density of the substance (in g cm^{-3}) by 1 g cm^{-3} gives a value numerically equal to the substance's density in g cm^{-3}.

(iii) Study the diagram of refraction through a rectangular glass block and answer the questions that follow.



Source: MyRevisionDeck | Internal

(a) With reference to the diagram, explain how the ray bends at each of the two surfaces of the glass block. [2]

Model answer: At the first surface of the glass block, the ray passes from air (rarer) into glass (denser). It bends towards the normal at the point of incidence on this surface. At the second surface (which is parallel to the first), the ray passes from glass (denser) back into air (rarer). It bends away from the normal at the point of incidence on this surface.

(b) With reference to the diagram, define the lateral displacement of the emergent ray. [2]

Model answer: Lateral displacement is the perpendicular distance between the path of the incident ray (extended through the block) and the emergent ray. In the diagram, it is shown by the perpendicular distance dropped from the emergent ray CD to the produced-through incident ray AB extended through the block.

7. (i) Describe what icebergs are, how much of an iceberg lies below the surface of sea water, and why icebergs are a danger to ships. [3]

Model answer: Icebergs are very large pieces of ice floating on sea water. The density of ice is 0.9 g cm^{-3} and the density of sea water is 1.02 g cm^{-3}. Because these two densities are very close, by the law of floatation a very large portion of the iceberg must remain submerged to displace enough sea water to balance its weight. Only a small portion is visible above the surface. The hidden underwater portion of an iceberg is much larger than the part visible above the surface. A ship can collide with this invisible part of the iceberg under the surface of the water, which is why icebergs are dangerous for ships.

(ii) The molecules of matter exert forces of attraction on one another.

(a) Why is the inter-molecular force of attraction described as an electrostatic force? [1]

Model answer: The inter-molecular force of attraction is described as an electrostatic force because it is caused by the charges on the molecules, not by their masses.

(b) Differentiate between the force of cohesion and the force of adhesion, and name two properties of liquids that result from them. [2]

Model answer: The force of cohesion is the force of attraction between molecules of the same substance, while the force of adhesion is the force of attraction between molecules of two different substances. In liquids, these forces are responsible for the properties of surface tension and viscosity.

(iii) Sound is a form of energy that is produced by a vibrating body and travels through a material medium.

(a) Why is sound said to be a form of energy? [2]

Model answer: When a body vibrates, the particles of the medium around it also vibrate. During these vibrations, the kinetic energy of each particle changes into potential energy and the potential energy changes back into kinetic energy. This is why sound is a form of energy.

(b) Compare the speed of sound in iron, water and air, giving its approximate value in each. [2]

Model answer: The speed of sound in iron is nearly 5000 m s^{-1}, in water it is nearly 1500 m s^{-1} and in air it is nearly 330 m s^{-1}. So the speed of sound is more in solids, less in liquids and still less in gases.

8. (i) An aluminium sphere has a volume of 100 cm^3 at 0 °C. Calculate its volume at 50 °C. (Coefficient of linear expansion of aluminium = 24 × 10^{-6} /°C) [3]

100.36 cm^3

Model answer: Formula: increase in volume, $\Delta V = V_0 \times \gamma \times \Delta T$, where cubical expansion coefficient $\gamma = 3 \times \alpha$.
Given: $V_0 = 100\ cm^3$, $\alpha = 24 \times 10^{-6}$ /°C, so $\gamma = 3 \times 24 \times 10^{-6} = 72 \times 10^{-6}$ /°C; $\Delta T = 50 - 0 = 50$ °C.
Substituting: $\Delta V = 100 \times 72 \times 10^{-6} \times 50 = 360000 \times 10^{-6} = 0.36\ cm^3$.
Final volume: $V = V_0 + \Delta V = 100 + 0.36 = 100.36\ cm^3$.
Volume at 50 °C = 100.36 cm^3.

(ii) A liquid exerts pressure within itself and on any body immersed in it.

(a) What is meant by the hydrostatic paradox? [1]

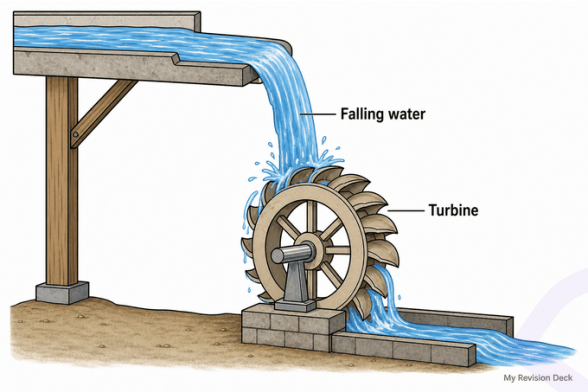
Model answer: The hydrostatic paradox is the phenomenon by which a liquid seeks its own level so that the height of the liquid is the same in connected tubes regardless of their cross-sections.

(b) Explain how a buoyant force acts on a body immersed in a liquid. [2]

Model answer: When a body is immersed in a liquid, the liquid exerts pressure on its top, bottom, and sides. Since liquid pressure increases with depth, the pressure on the bottom of the body is greater than on its top. The difference in pressure multiplied by the area of the bottom gives a net upward force on the body. This net upward force is called buoyant force or upthrust.

MY REVISION DECK

(iii) Study the diagram of a water mill turbine driven by falling water and answer the questions that follow.



Source: MyRevisionDeck | Internal

(a) Describe the energy transformations that take place from the water held above the turbine to the rotation of the turbine. [2]

Model answer: The water held above the turbine has gravitational potential energy due to its position at a height. As the water falls towards the turbine, this gravitational potential energy is converted into kinetic energy of the falling water. The kinetic energy of the falling water then strikes the blades of the turbine and rotates it, providing mechanical energy of rotation to the turbine.

(b) If the turbine is connected to a dynamo, what further energy conversion occurs, and where is such a setup commonly used? [2]

Model answer: When the turbine is connected to a dynamo (also called a generator), the mechanical energy of rotation is converted into electrical energy by the dynamo. Such a setup is used in hydroelectric power stations, where water collected in a dam at a height is made to fall on turbines connected to dynamos to produce electricity, called hydroelectricity.

********** End of paper **********

My Revision Deck