PHYSICS

Q.1	Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen, why?
Q.2	What is the audible range of sound for human beings ?
Q.3	What is the commercial unit of energy ?
Q.4	A person is listening to a tone of 500 Hz sitting at a distance of 450 m from the source of the sound. Calculate the time interval between successive compressions from the source ? (Speed of sound in air 5 330 m/s)
Q.5	Two bodies of equal masses move with uniform velocities of v and 3v respectively. Find the ratio of their kinetic energies.
Q.6	Can a body have energy, without having momentum ? If yes, why ?
Q.7	Explain the factors which determine wheter an object floats or sinks when placed on the surface of water.
Q.8	A wave pulse on a string moves a distance of 8m in 0.05s. (i) Find the velocity of the pulse. (ii) What would be the wavelength of the wave on the string if its frequency is 200 Hz ?
Q.9	In an oscillating pendulum, at what positions the potential and kinetic energy are maximum ?
Q.10	A 5 kg ball is thrown upwards with a speed of 10m/s. (take g = 10 m/s^2) (a) Calculate the maximum height attained by it. (b) Find the potential energy when it reaches the highest point.
Q.11	The potential energy of a free falling object decreases progressively. Does this violate the law of conservation of energy ? Why ?
Q.12	What is 'Ultra sound' ? Explain how defects in a metal block can be detected using ultra sound.
Q.13	Four persons jointly lift a 350 kg box to a height of 1 m and hold it. (a) Calculate the work done by the persons in lifting the box. (b) How much work do they do in just holding it ? (c) Why do they get tired while holding it ? (g = 10 ms^{-2})
Q.14	Write the observed energy transformation that takes place at thermal power station.
Q.15	A man holding a bucket of water on his head stands stationary. Is he doing any work ? Give reason.
Q.16	Hari and Shivam were playing on identical guitars whose strings were adjusted to give notes of the same pitch. Which of two, the quality of the two notes and frequencies be the same. Give reason for your answer.
Q.17	Define echo. Establish a mathematical relation between speed of sound, distance of reflecting body from source of sound and time for echo.
Q.18	An object of mass 40 kg is raised to a height of 5 m above the ground. What is its potential energy? If the object is allowed to fall, find its kinetic energy when it is half-way down.
Q.19	Define frequency, amplitude and speed of a sound wave.
Q.20	How the bats make use of ultrasonic waves to catch their prey ? Explain ?

Q.21	What is the range of frequencies associated with (a) Infrasound? (b) Ultrasound?
Q.22	A boy of mass 45 kg climbs up 20 steps in 20 sec. If each step is 25 cm high, calculate the power of the boy used in climbing. (Take g = 10 m/s^2)
Q.23	A ball is thrown vertically upwards with a velocity of 49 m/s. Calculate (i) the maximum height to which it rises. (ii)the total time it takes to return to the surface of the earth.
Q.24	An object thrown at certain angle to the ground moves in a curved path and falls back to the ground. The initial and the final points of the path of the object lie on the same horizontal line. What is the net work done by the force of gravity on the object ?
Q.25	Why does a block of plastic released under water come up to the surface of water?
Q.26	A sound wave travels at a speed of 339 m/s. If its wavelength is 1.5 cm, calculate the frequency of the wave.
Q.27	The earth, moving around the sun in a circular orbit, is acted upon by a force and hence work must be done on the earth by the force. Whether statement is correct or not. Give reasons for your answer.
Q.28	A body is thrown vertically upwards. Its velocity goes on decreasing. Write the change in kinetic energy when its velocity becomes zero.
Q.29	Find pressure, when a thrust of 20 N is applied on a surface area of 10 cm^2.
Q.30	State the energy conversions in a dry cell.
Q.31	Why sound wave is called a longitudinal wave?
Q.32	Write the formula to find the magnitude of the gravitational force between the earth and an object on the surface of the earth.
Q.33	Define work, energy and power. Give the SI units for each of these quantities. A man whose mass is 80 kg climbs up 30 steps of the stairs in 30 s. If each step is 12.5 cm in height, calculate the power used in climbing the stairs. (g = 10 m/s^2)
Q.34	What are the various energy transformations that occur when you are riding a bicycle?
Q.35	Identify the two factors on which the loudness of sound depends.
Q.36	What are wavelength, frequency, time period and amplitude of a sound wave?
Q.37	he sound of an explosion on the surface of lake is heard by a boatman 100 m away and a driver 100 m below the point of explosion. Of the two persons mentioned (boatman or driver) who would hear the sound first ? And why ?
Q.38	Prove that the work done on a moving object is always equal to the change in its kinetic energy. Calculate the work required to stop a car of mass 1500 kg moving with a velocity of 60 km/h.
Q.39	A SONAR device on a submarine sends a signal and receives an echo 5 s later. Calculate the speed of sound in water if the distance of the object from the submarine is 3625 m.
Q.40	A ball is thrown vertically upwards. Its velocity keeps on decreasing. What happens to its kinetic energy when it reaches the maximum height ?
Q.41	Explain how defects in a metal block can be detected using ultrasound.

Q.42	When do we say that work is done?
Q.43	A steel needle sinks in water but a steel ship floats. Explain how.
Q.44	You find your mass to be 52 kg on a weighing machine. Whether your mass is more or less than 52 kg ? Comment with reasons.
Q.45	When a player hits a football it moves along the curved path and then falls to the ground. Calculate the work done by the force of gravity on the football.
Q.46	At what speed a body of mass 1 kg will have a kinetic energy of 1 J ?
Q.47	Why do we hear sound produced by the humming bees while the sound of vibrations of pendulum is not heard ?
Q.48	What do you mean by free fall?
Q.49	Define is pressure. Why is it easy to walk on sand with flat shoes, than with high heel shoes ?
Q.50	What is the importance of universal law of gravitation?
Q.51	A mass of 10 kg is at a point A on a table. It is moved to a point B. If the line joining A and B is horizontal, what is the work done on the object by the gravitational force? Explain your answer.
Q.52	State the universal law of gravitation.
Q.53	Explain in brief the dependence of speed of sound on nature of material medium and temperature.
Q.54	When the wire of a guitar is plucked, what types of waves are produced in (i) air and (ii) wire ? Give reasons in support of your answer.
Q.55	Loaded test-tube placed in pure milk sinks to a certain mark (M). Now some water is mixed with the milk. Will the test tube sink more or less ? Explain.
Q.56	The volume of 50 g of a substance is 20 cm^3. If the density of water is 1 g cm^{-3}, will the substance float or sink?
Q.57	What is meant by loudness of sound ? On what factor does it depend ?
Q.58	Calculate the work done when a force of 15 N moves a body by 5 m in its direction.
Q.59	A sound wave has a frequency of 5000Hz. and wavelength of 20cm. How long will it take to travel 1 km ?
Q.60	Why will a sheet of paper fall slower than one that is crumpled into a ball?
Q.61	A person holds a bundle of hay over his head for 30 minutes and gets tired. Has he done some work or not? Justify your answer.
Q.62	Calculate the wavelength of a sound wave whose frequency is 220 Hz and speed is 440 m/s in a given medium.
Q.63	A ball is dropped from a height of 10 m. If energy of the ball reduces by 40% after striking the ground ,how high can the ball bounce back ? (g = 10m/s^2)
Q.64	Why is it difficult to hold a school bag having a strap made of a thin and strong string?
Q.65	A pair of bullocks exerts a force of 140 N on a plough. The field being ploughed is 15 m long. How much work is done in ploughing the length of the field?
Q.66	Explain the working and application of a sonar.

Q.67	Why are sound waves called mechanical waves?
Q.68	The frequency of a tuning fork is 550 Hz. Calculate the wavelength of waves produced by it. (Velocity of sound in air 5 332 m/s)
Q.69	A sonar device on a submarine sends out a signal and receives an echo 5 s later. Calculate the speed of sound.
Q.70	How does the force of gravitation between two objects change when the distance between them is reduced to half?
Q.71	Name the term used for the sum of kinetic energy and potential energy of a body.
Q.72	State the relationship between frequency and time period of a wave. The wavelength of vibrations produced on the surface of water is 2 cm. If the wave velocity is 16 m/s find its frequency and Time period.
Q.73	Define Kinetic Energy and Potential energy. Write an expression for K.E of a body of mass m moving with a speed v. Find the kinetic energy of a stone of 10 kg moving with a velocity of 10 m/s.
Q.74	What is the kinetic energy of an object ? Write an expression for the kinetic energy of an object of mass m moving with a speed v.
Q.75	Identify the energy possessed by a rolling stone.
Q.76	A stone is allowed to fall from the top of a tower 100 m high and at the same time another stone is projected vertically upwards from the ground with a velocity of 25 m/s. Calculate when and where the two stones will meet.
Q.77	What is reverberation ?
Q.78	What should be the change in velocity of a body required to increase its kinetic energy to four times of its initial value ?
Q.79	Write the formula to measure the work done, if the displacement of the object is at an angle of 90° to the direction of force.
Q.80	Can there be displacement of an object in the absence of any force acting on it? Think. Discuss this question with your friends and teacher.
Q.81	A body of mass 50 kg is situated at a height of 10 m. What is its potential energy. (Given, $g = 10ms^{-2}$)
Q.82	A stone is thrown vertically upward with an initial velocity of 40 m/s. Taking g = 10 m/s2, find the maximum height reached by the stone. What is the net displacement and the total distance covered by the stone?
Q.83	The frequency of a source of sound is 200 Hertz. Calculate the no. of times the source of sound vibrates in 1 minute. Also calculate the time period.
Q.84	"The flow of energy is unidirectional whereas the biogeochemical transfer is cyclic". Explain why ?
Q.85	A coolie holding a heavy box is waiting at the bus stand for 15 minutes. How much work is done by him ?
Q.86	Gravitational force on the surface of the moon is only as strong as gravitational force on the Earth. What is the weight in newtons of a 10 kg object on the moon and on the Earth?
Q.87	A lamp consumes 1000 J of electrical energy in 10 s. What is its power?

Q.88	What is meant by intensity of sound ? Mention the conditions for an echo to be heard clearly.
Q.89	A sonar device on a submarine sends out a signal and receives an echo 5 s later. Calculate the speed of sound in water if the distance of the object from the submarine is 3625 m.
Q.90	Define the term potential energy. Write the S.I. unit of potential energy.
Q.91	Explain the structure and working of human ear with labelled diagram.
Q.92	When we stand on loose sand, our feet go deep into the sand. But when we lie down on the sand our body does not go that deep in the sand. Why ?
Q.93	Does sound follow the same laws of reflection as light does? Explain.
Q.94	What do we call the gravitational force between the Earth and an object?
Q.95	Write an expression for the kinetic energy of an object.
Q.96	Why does a block of wood held under water rise to the surface when released ?
Q.97	Why are the ceilings of concert halls curved?
Q.98	Two friends Ram and Shyam, each having weight of 40 kg, go for rock climbing. Ram climbs to a height of 3 m in 10 s. and Shyam covers the same height in 12 s. Is the work done by Ram and Shyam equal ? or not ? Compare the power of Ram and Shyam.
Q.99	A sound wave has a frequency 2 khz and wavelength 40 cm. Calculate time it take to travel 1.6 km.
Q.100	Illustrate the law of conservation of energy by discussing the energy changes which occur when we draw a pendulum bob to one side and allow it to oscillate. Why does the bob eventually come to rest? What happens to its energy eventually? Is it a violation of the law of conservation of energy?
Q.101	Define work done by a constant force on an object. Write an expression also for the work done.
Q.102	Soni says that the acceleration in an object could be zero even when several forces are acting on it. Do you agree with her? Why?
Q.103	A toy car is displaced through 5m on application of a force of 7N. Let us take it that the force acts on the object through the displacement. What is the work done in this case ?
Q.104	How is the pressure variation in a sound wave amplified in human ear ?
Q.105	State Archimedes' Principle. Based on this principle, write its two applications.
Q.106	A ball of mass 0.5 kg slows down from a speed of 5 m/s to that of 3 m/s calculate the change in kinetic energy of the ball.
Q.107	What does SONAR stands for ? Using SONAR, sound pulses are emitted at the surface. These pulses after being reflected from the bottom are detected. If the time interval from the emission to the detection of the sound pulses is 2.6 seconds, find the depth of water.
Q.108	A body is vibrating 6000 times in one minute. If the velocity of sound in air is 360 m/s, find (a) Frequency of vibration in hertz. (b) Wavelength of the wave produced.
Q.109	20 waves pass trough a point in 2 seconds. If the distance between one crest and adjacent through is 1.5 m. Calculate : (a) the frequency (b) the wave length
Q.110	If two equal weights of unequal volumes are balanced in air, what will happen when these are completely

	dipped in water ?
Q.111	What is the magnitude of the gravitational force between the earth and a 1 kg object on its surface? (Mass of the earth is 6×10^{24} kg and radius of the earth is 6.4×10^6 m).
Q.112	Gravitational force acts on all objects in proportion to their masses. Why then, a heavy object does not fall faster than a light object?
Q.113	A light and heavy object have the same momentum, find out the ratio of their Kinetic energies. Which one has a larger Kinetic energy ?
Q.114	What are the differences between the mass of an object and its weight?
Q.115	Derive an expression for kinetic energy of a body of mass m, when it is moving with a velocity v.
Q.116	Define potential energy. Write an expression for potential energy of an object of mass m raised through a height h.
Q.117	A ball is dropped into a pond from a height of 44.1 m. The splash of sound is heard 3.13 second after the ball is dropped. Determine the velocity of sound in air.
Q.118	The kinetic energy of an object of mass, m moving with a velocity of 5 m s^{-1} is 25 J. What will be its kinetic energy when its velocity is doubled? What will be its kinetic energy when its velocity is increased three times?
Q.119	Give reason why, a block of plastic when released under water comes up to the surface of water.
Q.120	Explain how the human ear works.
Q.121	An electronic bulb of 60 W is used for 6 hours per day. Calculate the units of energy consumed in one day by the bulb.
Q.122	Why the stage of an auditorium has curved background, curtains, carpets and false ceiling ?
Q.123	What would be the amount of work done on an object by a force, if the displacement of the object is zero ?
Q.124	Why does an object float or sink when placed on the surface of water?
Q.125	A cork floats in water, while the iron nail sinks. Give reason.
Q.126	Which wave property determines (a) loudness, (b) pitch?
Q.127	A body of mass 2 kg is thrown vertically upwards with an initial velocity of 20 m/s. What will be its potential energy at maximum height (g510m/s^2)
Q.128	Calculate the energy in kWh consumed in 10 hours by four devices of power 500 W each.
Q.129	What is reverberation? How can it be reduced?
Q.130	A boy strikes one end of a long pipe with a stone. Another boy who keeps his ear close to the other end of pipe heard two sounds in a short interval of time. Explain, why ?
Q.131	What is the work done by the force of gravity on a satellite moving round the earth? Justify your answer.
Q.132	A ball thrown up vertically returns to the thrower after 6 s. Find (a) the velocity with which it was thrown up, (b) the maximum height it reaches, and (c) its position after 4 s.
Q.133	How much work is done when a force of 1 N moves a body through a distance of 1 m in its direction ?

Q.134	Calculate the work required to be done to stop a car of 1500 kg moving at a velocity of 60 km/h?
Q.135	A mobile ringing inside a vacuum chamber cannot be heard outside. Why ?
Q.136	A 40 kg girl is running along a circular path of radius 1 m with a uniform speed. How much work is done by the girl is completing are circle ?
Q.137	In a ripple tank, ten ripples are produced per second. If the distance between a trough and a neighbouring crest is 12 cm, calculate the frequency, wavelength and velocity of the wave.
Q.138	Distinguish between the following : (a) Mechanical Waves and Electromagnetic Waves. (b) Loudness ad Intensity. (c) Crest and Compression
Q.139	Give the formula for calculating work done. What is the SI unit of work ?
Q.140	An echo is returned in 6 seconds. What is the distance of reflecting surface from source ? [given that speed of sound is 342 m/s.]
Q.141	Define 1 J of work.
Q.142	Derive an expression for the kinetic energy of an object. Write the S.I unit of kinetic energy.
Q.143	Define 1 Joule of work.
Q.144	At what rate is electrical energy consumed by a bulb of 60 watt ?
Q.145	What is the audible range of the average human ear?
Q.146	A boy of mass 50 kg runs up a staircase of 40 steps in 8 s. If the height of each step is 15 cm, find his power. (Given, $g = 10$ ms^{-2})
Q.147	A stone is dropped from the top of a tower 500 m high into a pond of water at the base of the tower. When is the splash heard at the top? Given, $g = 10$ m s^{-2} and speed of sound $= 340$ m s^{-1}.
Q.148	In each of the following a force, F is acting on an object of mass, m. The direction of displacement is from west to east shown by the longer arrow. Observe the diagrams carefully and state whether the work done by the force is negative, positive or zero.
Q.149	Is it possible that a force is acting on a body but still work done is zero ? Explain giving one example.
Q.150	Define the time period of a wave.
Q.151	A freely falling object eventually stops on reaching the ground. What happens to its Kinetic energy on reaching the ground.
Q.152	How do our ears permit us to receive the sound ?
Q.153	What is meant by reverberatrion of sound ? Does reverberation produce undersirable effects in big hall or auditorium ? If yes, how are the undesirable effects avoided ?
Q.154	An echo returned in 3 s. What is the distance of the reflecting surface from the source, given that the speed of sound is 342 m s^{-1}?

Q.155	A man weighing 70 kg carries a weight of 10 kg on the top of a tower 100 m high. Calculate the work done by the man (g = 10 m/s^2)
Q.156	A car and a truck are moving with the same velocity of 60 km/hr. Which one has more kinetic energy ? (Mass of truck > Mass of car).
Q.157	Two bodies have their masses $m_1/m_2 = 3$ and their kinetic energies $E_1/E_2 = 1/3$. What will be the ratio of their velocities ?
Q.158	Define the term 'average power'.
Q.159	Name the type of energy possessed by the following : (i) Stretched slinky (ii) speeding car
Q.160	What is power?
Q.161	The potential energy of a freely falling object decreases progressively. Does this violate the law of conservation of energy? Why?
Q.162	What do you mean by acceleration due to gravity?
Q.163	Give the mathematical relation between power, force and velocity.
Q.164	Give the S.I. unit of power .
Q.165	When is work done by a force negative ?
Q.166	Write the full name of SONAR. How will you determine the depth of a sea using echo ranging ?
Q.167	Find the energy possessed by an object of mass 10 kg when it is raised to a height of six metre above the ground given g = 9.8 m s^{-2}.
Q.168	The earth and the moon are attracted to each other by gravitational force. Does the earth attract the moon with a force that is greater or smaller or the same as the force with which the moon attracts the earth? Why?
Q.169	If the moon attracts the earth, why does the earth not move towards the moon?
Q.170	An electric heater of 1500 watt is switched on for 10 hours. Calculate the electric energy consumed by the heater.
Q.171	A coolie is walking on a railway platform with a load of 30 kg on his head. How much work is done by coolie ?
Q.172	A sound wave travels at a speed of 339 m s^{-1}. If its wavelength is 1.5 cm, what is the frequency of the wave? Will it be audible?
Q.173	A body of mass 'm' is raised to a vertical height h through two different paths X and Y. What will be the potential energy of the body in the two cases ? Give reason for your answer.
Q.174	Can any object have momentum even if its mechanical energy is zero ? Explain why ?
Q.175	A freely falling object eventually stops on reaching the ground. What happens to its kinetic energy?
Q.176	Define 1 watt of power:
Q.177	A force of 10 N moves a body with a constant speed of 2 m/s. Calculate the power of the body.
Q.178	Seema tried to push a heavy rock of 100 kg for 200 s but could not move it. Find the work done by Seema at the end of 200 s.

Q.179	A person has a hearing range from 20 Hz to 20 kHz. What are the typical wavelengths of sound waves in air corresponding to these two frequencies? Take the speed of sound in air as 344 m s^{-1}.
Q.180	State Archimedes principle. Give any two examples where Archimedes principle is applied.
Q.181	Which characteristic of sound helps to identify your friend by his voice while sitting with others in a dark room ?
Q.182	Suppose you and your friend are on the moon. Will you be able to hear any sound produced by your friend?
Q.183	What are Infrasonic and Ultrasonic sound waves ?
Q.184	An electric heater is rated 1500 W. How much energy does it use in 10 hours?
Q.185	Two girls each of weight 400 N climb up a rope through a height of 8m. Let the name one of the girls is A and that of other is B. Girl A takes 20s while B takes 50s to accomplish this task. Calculate the power expended by each girl.
Q.186	A stone is released from the top of a tower of height 19.6 m. Calculate its final velocity just before touching the ground.
Q.187	What causes reverberation of Thunder sound ?
Q.188	Write an expression for the work done when a force is acting on an object in the direction of its displacement.
Q.189	How do the bats search and catch their prey in dark night ?
Q.190	Calculate the force of gravitation between the earth and the Sun, given that the mass of the earth = 6×10^{24} kg and of the Sun = 2×10^{30} kg. The average distance between the two is 1.5×10^{11} m.
Q.191	What is the work done by the earth in moving around the sun ?
Q.192	Define 1 watt. An electric bulb of 60 W (sixty watt) is used for 6 (six) hours per day. Calculate the units of energy consumed in one day by the bulb.
Q.193	Two girls A and B, each of weight 400 N climb up a rope through a height of 8 m. Girl A takes 20 sec. while B takes 50 sec. to accomplish this task. What is the power expanded by each girl ?
Q.194	Certain force acting on a 20kg mass changes its velocity from 5m/sec to 2m/sec. Calculate the work done by the force.
Q.195	How much work is done by a weight lifter when he holds a weight of 80 kgs on his shoulders for two minutes ?
Q.196	'During free fall of an object, there is decrease in potential energy and increase in kinetic energy'. Explain.
Q.197	An object of mass 10 kg is moving with a uniform velocity of 5 ms^{-1}. Calculate the kinetic energy possessed by the object.
Q.198	Find the energy in kW h consumed in 10 hours by four devices of power 500 W each.
Q.199	What is the kinetic energy of an object?
Q.200	When a sound is reflected from a distant object, an echo is produced. Let the distance between the reflecting surface and the source of sound production remains the same. Do you hear echo sound on a hotter day?

CHEMISTRY

Q.1	The following data represents the distribution of electrons, protons and neutrons in atoms of four elements A, B, C, D.

ELement	Protons	Neutrons	Electrons
A	9	10	9
B	16	16	16
C	12	12	12
D	17	22	17

Answer the following questions:-
(a) Give the electronic distribution of element B.
(b) The valency of element A
(c) The atomic number of element B ?
(d) The mass number of element D ?

Q.2	Give one important application of an isotope of cobalt.
Q.3	Calculate the mass of 10 moles of carbon dioxide.
Q.4	The average atomic mass of a sample of an element X is 16.2 u. What is the % of isotopes $^{16}_{8}X$ and $^{16}_{8}X$ in the sample ?
Q.5	Calculate the molecular mass of $CaCO_3$. (At mass Ca = 40 u, C = 12 u, O = 16 u) CaCO3
Q.6	Calculate the number of molecules of sulphur (S_8) present in 16 g of solid sulphur.
Q.7	Write the distribution of electrons in carbon and sodium atoms?
Q.8	Which postulate of Dalton's atomic theory is the result of the law of conservation of mass?
Q.9	What is the drawback of Rutherford's model of an atom ?
Q.10	If relative density of aluminium is 2.7 and density of water is 1000 kg/m^3. What is the density of aluminium in SI unit ?
Q.11	5 g of calcium combine with 2 g of oxygen to form a compound. Find the molecular formula of the compound. (Atomic mass of Ca540 u ; O516 u)
Q.12	What mass of silver nitrate will react with 5.85g of sodium chloride to produce 14.35 g of silver chloride and 8.5 g of sodium nitrate if the law of conservation of mass is true.
Q.13	Calculate the mass of 0.5 moles of Nitrogen (N_2) gas (Atomic mass of N = 14u).
Q.14	Number of valence electrons in Cl$^-$ ion are : (a) 16 (b) 8 (c) 17 (d) 18.
Q.15	Calculate the number of aluminium ions present in 0.051 g of aluminium oxide.

	(Hint: The mass of an ion is the same as that of an atom of the same element. Atomic mass of Al = 27 u)
Q.16	Convert into mole. (a) 12 g of oxygen gas (b) 20 g of water (c) 22 g of carbon dioxide
Q.17	If the number of molecules in a given sample of sulphur dioxide (SO_2) is 3.011 x 10^{23},calculate the following : (i) The number of moles in the given sample. (ii) Mass of Sulphur dioxide in the given sample. (iii) Number of oxygen atoms in the given sample. (Atomic mass of S = 32u ; O = 16u)
Q.18	Give definition of ion in your own words.
Q.19	J. Chadwick discovered a, subatomic particles which has no charge and has mass nearly equal to that of a proton. Name the particle and give its location in the atom.
Q.20	Write the symbol of an element A with atomic number thirteen and mass number 27 respectively.
Q.21	Calculate the following quantities in 5.6 g of nitrogen [Atomic mass of N = 14 u] (a) Number of moles of N_2. (b) Number of molecules of N_2. (c) Number of atoms of nitrogen.
Q.22	Calculate number of atoms in 120 g of calcium and 120 g of iron. Which one has more number of atoms and how much is the difference ? (given atomic mass of calcium 5 40 u and iron 5 56 u)
Q.23	The volume of 40 g of a solid is 15 cm 3. If the density of water is 1g/cm 3, will the solid float or sink ? Why ?
Q.24	An element 'X' has atomic number 19 and its mass number is 39. Calculate the number of electron and neutrons in it.
Q.25	Name two biologically important compounds that contain both oxygen and nitrogen.
Q.26	State Bohr's postulates about the model of an atom. Draw a sketch of Bohr's model of an atom with three shells.
Q.27	Which has more number of atoms 100g of sodium or 100g of iron (At mass Na = 23 u, Fe = 56 u)
Q.28	Mention the postulates Neils Bohr put forth to overcome the objections raised against Rutherford's atomic model.
Q.29	A dining hall has dimension 50 m 3 15 m 3 3.5 m. Calculate the mass of air in the hall. (Given, density of air 5 1.30 kg/m^3)
Q.30	On the basis of Thomson's model of an atom, explain how the atom is neutral as a whole.
Q.31	Define atomicity. Calculate the number of atoms in the following compounds : (i) Ozone (ii) Sodium chloride
Q.32	If number of electrons in an atom is 8 and number of protons is also 8, then (i) what is the atomic number of the atom and (ii) what is the charge on the atom?

Q.33	Mention the 2 postulates of Dalton's Atomic Theory that explain : (a) Law of Conservation of Mass (b) Law of Constant Proportions.
Q.34	The total number of nucleons in the atoms of calcium and argon is 40 and the atomic number of calcium and argon are 20 and 18 respectively. Name the pair of these two elements and also find out the number of neutrons present in the nucleus of argon atom.
Q.35	One atom of an element contains 8 protons and 8 neutrons. Find (i) number of electrons (ii) atomic number (iii) atomic mass
Q.36	Name the three sub-atomic particles of an atom.
Q.37	Calculate the number of moles is 52 gas of He (Helium) At mass : O = 16 u and He = 4 u
Q.38	State the drawbacks of Rutherford's model of the atom ? Explain the suggestions put forward by Neils Bohr in his model of atom to overcome these drawbacks.
Q.39	In the gold - foil experiment, what observations led Rutherford to conclude (i) Most of the space inside the atom is hollow. (ii) The central portion of the atom is positively charged (iii) Volume occupied by the nucleus is very small as compared to the total volume of the atom. (iv) Almost the entire mass of the atomic concentrated at its centre.
Q.40	What are the limitations of J.J. Thomson's model of the atom?
Q.41	Relative densities of two substances A and B are 2.5 and 0.9 respectively. Find densities of A and B. Also find whether they will sink or float in water. (Density of water = 1000 kg/m^3).
Q.42	An element 'Z' forms the following compound when it reacts with hydrogen, chlorine, oxygen and phosphorus. ZH_3, ZCl_3, Z_2O_3 and ZP (a) What is the valency of element Z ? (b) Element 'Z' is metal or non metal ?
Q.43	Elements A and B have atomic numbers 18 and 16 respectively. Which of these two would he more reactive and why ?
Q.44	The ratio of hydrogen and oxygen in water is 1:8 by mass, find out their ratio by number of atoms, in one molecule of water.(At mass H=1 u ; O=16 u)
Q.45	Define valency of an element. Find the valency of chlorine and Magnesium (At. No. Of Chlorine 5 17, Magnesium 512)
Q.46	What are the limitations of Rutherford's model of the atom?
Q.47	On the basis of Rutherford's model of an atom, which subatomic particle is present in the nucleus of an atom?
Q.48	Define relative density of a substance. Relative density of silver is 10.8. The density of water is 1000 kgm^{-3} . What is the density of silver in SI units ?
Q.49	Write the names of compounds represented by the following formulae :

(i) KNO_3

(ii) $Al_2(SO_4)_3$

(iii) $MgCl_2$

(iv) $(NH_4)_2SO_4$

KNO_3

(ii)

$Al_2(SO_4)_3$

(iii)

$MgCl_2$

(iv)

$(NH_4)_2SO_4$

Q.50	List three steps of experiment performed by Rutherford for his model of an atom.
Q.51	Hydrogen and oxygen combine in the ratio of 1:8 by mass to form water. What mass of oxygen gas would be required to react completely with 3 g of hydrogen gas ?
Q.52	Define atomic mass unit.
Q.53	If K and L shells of an atom are full, then what would be the total number of electrons in the atom?
Q.54	Chlorine occurs in nature in two isotopic forms, with atomic masses 35 u and 37 u in the ratio of 3 : 1. Calculate the average atomic mass of chlorine atom.
Q.55	Composition of the nuclei of two atomic species A and B are given as under : A B Protons 17 17 Neutrons 18 20 (i) What are the mass numbers of A and B ? (ii) How are they related to each other ?
Q.56	Potassium chlorate decomposes, on heating, to form potassium chloride and oxygen. When 24.5 g of potassium chlorate is decomposed completely, then 14.9 g of potassium chloride is formed. Calculate the mass of oxygen formed. State the law of chemical combination which you have used in solving this problem.
Q.57	State two main postulates of Thomson's model of an atom.
Q.58	The following data represents the distribution of electrons, protons and neutrons in atoms of four elements A,B,C, D.

Element	Protons	Neutrons	Electron
A	19	21	19
B	17	18	17
C	17	20	17
D	18	22	18

Answer the following questions :-

	(i) Describe the electronic distribution in atom of element B. (ii) Is element B a metal or a non - metal ? Why ? (iii) Which two elements form a pair of ISOTOPES ? (iv) Which two elements form a pair of ISOBARS ?
Q.59	Which one of the following is a correct electronic configuration of sodium? (a) 2, 8 (b) 8, 2, 1 (c) 2, 1, 8 (d) 2, 8, 1
Q.60	An element "M" forms the compound. MH_3 when it reacts with hydrogen, (i) Find the valency of element M ? (ii) Is Element "M" is metal or a non - metal ?
Q.61	Calculate the number of molecules in 8 g of O_2.
Q.62	List three main features of Rutherford's nuclear model of an atom.
Q.63	Composition of the nuclei of two atomic species X and Y are given as under X Y Protons = 6 6 Neutrons = 6 8 Give the mass numbers of X and Y. What is the relation between the two species?
Q.64	A boy of mass 45 kg climbs up 20 steps in 20 second. If each step is 25 cm high, calculate the power used in climbing.
Q.65	Which has more number of atoms? (a) 100 grams of sodium (b) 100 grams of iron (Given, atomic mass of Na = 23 u : Fe = 56 u)
Q.66	Write down the names of compounds represented by the following formulae: (i)$Al_2(SO_4)_3$ (ii) $CaCl_2$ (iii) K_2SO_4 (iv) KNO_3 (v) $CaCO_3$
Q.67	Define relative density.
Q.68	If bromine atom is available in the form of, say, two isotopes (49.7%) and (50.3%), calculate the average atomic mass of bromine atom.
Q.69	Define Avogadro's number. Why is it also known as Avogadro constant ?
Q.70	Which postulate of Dalton's atomic theory can explain the law of definite proportions?
Q.71	Calculate the formula unit mass of $CaCO_3$. (Given, Ca = 40 u, C = 12 u and O = 16 u)

Q.72	Describe Bohr's model of the atom.
Q.73	What is the difference between an atom and a molecule ?
Q.74	When 3.0 g of carbon is burnt in 8.0 g of oxygen, 11.0 g of carbon dioxide is produced. What mass of carbon dioxide will be formed when 3.0 g of carbon is burnt in 50.00 g of oxygen ? Which law of chemical combination will govern your answer ? State the law.
Q.75	Summarize the rules for writing of distribution of electrons in various shells for the first eighteen elements.
Q.76	Give the names of the elements present in the following compounds: (a) Quick lime (b) Hydrogen bromide (c) Baking powder (d) Potassium sulphate
Q.77	Define the following terms with example. (a) Atomicity (b) Anion (c) Molecular Mass (d) Relative Formula Mass (e) Cation
Q.78	Relative density of silver in 10.8. The density of water is 10 3 kg m23 . What is the density of silver in SI unit ?
Q.79	2 gm of hydrogen combines with 16 gm of oxygen to form water. How many grams of water will be formed ? State the law of chemical combination which you have used in this calculation.
Q.80	Name the fundamental particle not present in the nucleus of hydrogen atom.
Q.81	Define polyatomic ions and give an example.
Q.82	How Rutherford proved that positively charged particles are present in the nucleus of an atom ?
Q.83	If one mole of carbon atoms weighs 12 gram, what is the mass (in gram) of 1 atom of carbon?
Q.84	What is the mass of— (a) 1 mole of nitrogen atoms? (b) 4 moles of aluminium atoms (Atomic mass of aluminium = 27)? (c) 10 moles of sodium sulphite (Na_2SO_3)?
Q.85	Ravi prepared a solution of sodium chloride by mixing 5.85 g of salt in 1 litre of water. Find. (a) Molar mass of sodium chloride (b) Number of moles of sodium chloride dissolved. (Atomic masses of sodium and chlorine are 23 u and 35.5 u respectively). (c) Concentration of the sodium chloride solution.
Q.86	On the basis of the number of protons, neutrons and electrons in the samples given below identify (a) the cation (b) the pair of isobars and (c) the pair of isotopes. <table><tr><td>Sample</td><td>Protons</td><td>Neutrons</td><td>Electrons</td></tr><tr><td>A</td><td>17</td><td>18</td><td>16</td></tr><tr><td>B</td><td>18</td><td>19</td><td>18</td></tr></table>

C	17	20	17	
D	17	17	17	

Q.87	State the significance of one mole.
Q.88	Calculate the number of particles in each of the following. (a) 48 g of Mg (b) 8 g O_2 (c) 0.1 mole of carbon (Atomic mass Mg = 24 u, O = 16 u, C = 12 u, Avogadro Constant $N_A = 6.022310^{23}$).
Q.89	Isotopes of element have : (a) the same physical properties (b) different chemical properties (c) different number of neutrons (d) different atomic numbers
Q.90	Write the chemical formula of Zinc nitrate.
Q.91	State the law of constant proportion. Magnesium and oxygen combine in the ratio of 3 : 2 by mass to form magnesium oxide. How much oxygen is required to react completely with 12 g of magnesium ?
Q.92	Sample A contains one gram molecule of oxygen molecule and sample B contains one mole of oxygen molecule. What is the ratio of the number of molecules in both the samples ?
Q.93	What is the similarity in the electronic structure of the following set of atoms ? (a) Lithium (b) Sodium (c) Potassium
Q.94	Rutherford's alpha-particle scattering experiment was responsible for the discovery of (a) Atomic Nucleus (b) Electron (c) Proton (d) Neutron
Q.95	Bromine exist into two isotopes one having Br(49.7%) atomic number 35 and mass number 79 and the other Br(50.3%) having atomic number 35 and mass number 81. Calculate the average atomic mass of bromine atom.
Q.96	Write the formula of the compounds (1) Calcium sulphate (2) Aluminium chloride
Q.97	How many moles are present in 4g of Potassium Hydroxide KOH ? (Atomic mass of K = 39 u, H = 1 u, O = 16 u)
Q.98	Helium atom has an atomic mass of 4u and two protons in its nucleus. How many neutrons does it have ?
Q.99	Give an example of polyatomic molecule of an element.
Q.100	State the three rules proposed by Bohr and Bury regarding distribution of electrons in different orbits of atoms.
Q.101	Mention the formula of sodium nitride.

Q.102	State the postulate of Dalton's atomic theory which can explain the law of definit proportions ?
Q.103	The atomic mass of an element X is 16.2 u. What are the percentages of isotope X having atomic number 8 and mass numbers 16 and 18.
Q.104	2.8 g of Nitrogen gas was allowed to react with 0.6 g of Hydrogen gas to produce 3.4 g of Ammonia. Show that these observations are in agreement with the law of Conservation of mass. State the law of conservation of mass.
Q.105	Define isotopes with one example. Write two applications of isotopes.
Q.106	What is the mass of: (a) 0.2 mole of oxygen atoms? (b) 0.5 mole of water molecules?
Q.107	Na+ has completely filled K and L shells. Explain.
Q.108	What are canal rays?
Q.109	Why is it not possible to see an atom with naked eyes?
Q.110	If K and L shells of an atom are full, then what would be the total number of electrons in the atom ? What is the valency of this element ?
Q.111	If 'K' and 'L' shells of an atom are completely filled electrons, then what would be (i) the total number of electrons in the atom and (ii) its valency ?
Q.112	Calculate the number of moles in 5.75 g of sodium (atomic mass of sodium = 23).
Q.113	State and explain the law of constant proportion taking an example of ammonia.
Q.114	Calculate the molar mass of the following substances: (a) Ethyne, C_2H_2 (b) Sulphur molecule, S_8 (c) Phosphorus molecule, P_4 (atomic mass of phosphorus = 31) (d) Hydrochloric acid, HCl (e) Nitric acid, HNO_3
Q.115	How do we know the presence of atoms if they do not exist independently for most of the elements.
Q.116	If Z = 3, what would be the valency of the element? Also, name the element.
Q.117	Elements from A to E have in them the distribution of e,p and n as follows.

Elements	Electrons	Neutrons	Protons
A	4	4	3
B	8	9	9
C	18	22	8
D	17	20	17
E	17	18	17

Making use of these data find
(i) cation
(ii) anion
(iii) a pair of isotopes

	(iv) an atom of noble gas
Q.118	When 3.0 g of carbon is burnt in 8.00 g oxygen, 11.00 g of carbon dioxide is produced. What mass of carbon dioxide will be formed when 3.00 g of carbon is burnt in 50.00 g of oxygen? Which law of chemical combinations will govern your answer?
Q.119	Define the term 'atomic mass unit'. How is it linked with relative atomic mass ?
Q.120	What is the number of valence electrons in (i) sodium ion (Na^+) (ii) oxide ion (O^{2-}) (Atomic number of Na = 11 ; O = 8)
Q.121	The average atomic mass of a sample of an element X is 16.2 u. What are the percentages of isotopes and in the sample?
Q.122	Mention one use of each of the following : (i) Isotope of cobalt (ii) Isotope of iodine
Q.123	Hydrogen and oxygen combine in the ratio of 1:8 by mass to form water. What mass of oxygen gas would be required to react completely with 3 g of hydrogen gas?
Q.124	Name one element which form diatomic and one which form tetra atomic molecules.
Q.125	Name the body which approves the nomenclature of elements and compounds.
Q.126	Nucleus of an atom is heavy and positively charged. Justify your answer.
Q.127	What are polyatomic ions? Give examples?
Q.128	What are polyatomic ions ?
Q.129	Calculate the molecular masses of H_2, O_2, Cl_2, CO_2, CH_4, C_2H_6, C_2H_4, NH_3, CH_3OH.
Q.130	What do you think would be the observation if the α-particle scattering experiment is carried out using a foil of a metal other than gold?
Q.131	Verify by calculating that (a) 5 moles of CO_2 and 5 moles of H_2O do not have the same mass (b) 240g of calcium and 240 g of magnesium elements have a mole ratio of 5 : 3 (At mass H = 1u, Ca = 40u, Mg = 24u)
Q.132	Calculate the following : (i) The mass of 1.0505×10^{23} molecules of carbon dioxide (CO_2). (ii) The number of molecules of 0.25 moles of ammonia (NH_3). (iii) The formula unit mass of sodium sulphite (Na_2SO_3). (Atomic mass : Na = 23 u ; S = 32 u ; O = 16 u ; H = 1u) ($N_A = 6.022 \times 10^{23}$ mol^{-1}) molecules of carbon dioxide (CO_2)
Q.133	The mass of an empty 40 litre petrol tank of a vehicle is 8.0 kg. What will be its mass when filled completely with a fuel of density 700 kg/m^3.
Q.134	Write down the formulae of (i) sodium oxide (ii) aluminium chloride (iii) sodium suphide (iv) magnesium hydroxide

Q.135	Describe Bohr's model of an atom.
Q.136	In a reaction, 5.3 g of sodium carbonate reacted with 6 g of ethanoic acid. The products were 2.2 g of carbon dioxide, 0.9 g water and 8.2 g of sodium ethanoate. Show that these observations are in agreement with the law of conservation of mass. Sodium carbonate + ethanoic acid → sodium ethanoate + carbon dioxide + water
Q.137	Define valency by taking examples of silicon and oxygen.
Q.138	Find the mass of 10 moles of carbon dioxide (Given, C = 12 u; O = 16 u)
Q.139	The symbol of sodium is written as Na and not as S. Give reason.
Q.140	Write the chemical formulae of the following. (a) Potassium chloride (b) Magnesium hydroxide (c) Ammonium sulphate
Q.141	State the rules followed for writing the number of electrons in different energy shells.
Q.142	For the following statements, write T for 'True' and F for 'False'. (a) J.J. Thomson proposed that the nucleus of an atom contains only nucleons. (b) A neutron is formed by an electron and a proton combining together. Therefore, it is neutral. (c) The mass of an electron is about times that of proton. (d) An isotope of iodine is used for making tincture iodine, which is used as a medicine.
Q.143	Which scientist concluded that size of nucleus is very small as compared to size of an atom ?
Q.144	If an atom contains one electron and one proton, will it carry any charge or not?
Q.145	Illustrate in brief the drawbacks of Rutherford's atomic model.
Q.146	An atom of an element has one electron in the outermost M shell. State its: (a) Electronic configuration (b) Number of protons (c) Atomic number (d) Valency of this element
Q.147	List the important observations made by Rutherford from his a–particle scattering experiment. 35Z
Q.148	What is molar mass ? Calculate the molar mass of carbon dioxide gas.
Q.149	Calculate the formula unit masses of ZnO, Na_2O, K_2CO_3, given atomic masses of Zn = 65 u, Na = 23 u, K = 39 u, C = 12 u, and O = 16 u.
Q.150	Calculate the molar mass of Na_2O. (Given, Na = 23 u; O = 16 u)