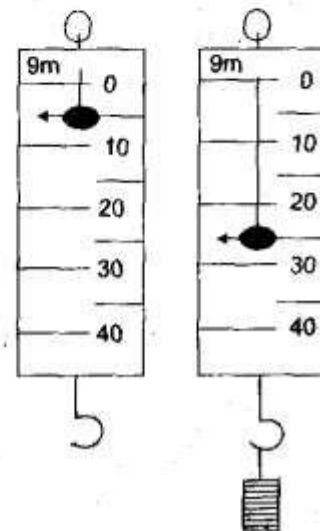


- Q. 1.** Select a quantity for which one of the units is pascal.
 ① Energy ② Power ③ Buoyant force ④ Pressure
- Q. 2.** A passenger in a moving train tosses a coin which falls behind him. What can you say about the motion of train?
 ① Uniform ② Retarded ③ Accelerated ④ At rest
- Q. 3.** Ancient Indian astronomer had defined _____ constellations.
 ① 29 ② 27 ③ 88 ④ 86
- Q. 4.** An echo sounder in a fishing boat receives an echo from a shoal of fish 0.4 seconds after it was sent. If the speed of sound in water is 1,500 m/s, how deep is the shoal?
 ① 150 m ② 7,500 m ③ 300 m ④ 600 m
- Q. 5.** While painting a house, the painter uses _____ base to get desired shade.
 ① white ② slightly rough
 ③ light shade of desired shade ④ off white
- Q. 6.** Which of the following statements is *not true* with reference to static electricity?
 ① Electric charge is weak
 ② Charge is developed due to rubbing of specific substances
 ③ Charge lasts for shorter time duration
 ④ Static electricity can not create electric field
- Q. 7.** Observe the diagram showing a spring balance with and without an object attached to it. What amount of water will be displaced if this object of density 2 g/cm^3 is dipped completely in water?

- ① 25 ml ② 10 ml
 ③ 30 ml ④ 20 ml



Q. 8. Arrange the speed of sound in following media in ascending order.
a. Air at 0 °C b. Iron c. Blood d. Distilled water

- ① d, a, c, b ② b, c, d, a ③ a, d, C, b ④ a, c, d, b

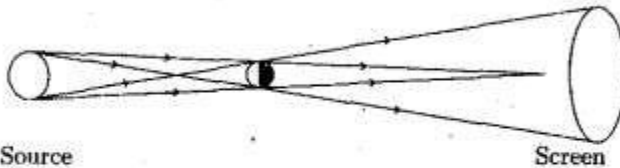
Q. 9. Which of the following factors rule predominantly in the event of dew formation, sweating, rate of evaporation?

- ① Humidity ② Surface area ③ Volume ④ Radiation

Q. 10. _____ is an unit of heat.

- ① °C ② °F ③ cal ④ cal/g °C

Q. 11. The diagram explains reason for which of the following statements?



- ① Umbra is dark and penumbra is faint.
② An aeroplane does not cast a shadow.
③ Extended source can not create umbra.
④ In a pin hole camera image is inverted.

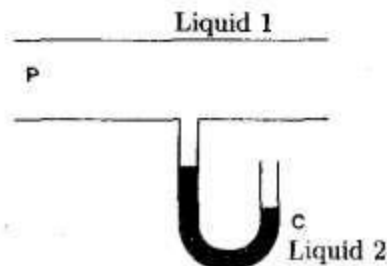
Q. 12. Zero weight can be observed _____.

- ① at interplanetary space ② in lifts
③ on a merry-go-round ④ at the centre of the Earth

Q. 13. Select the most appropriate set of words which can be used to give reason for the statement, 'small animals falling from considerable height can escape without any major injury'.

- ① Small mass, less momentum, inertia.
② Small mass, less momentum, less opposing force.
③ Small mass, inertia, time, law of conservation of momentum.
④ Small mass, kinetic and potential energy, shock absorbing structure.

Q. 14. Observe the diagram.
This arrangement can be used for which of the following purposes?



- ① To determine whether tube P is in inclined position or not.
- ② To determine difference in atmospheric pressure and pressure of liquid in tube P.
- ③ To determine the difference in density of liquids 1 and 2.
- ④ Insufficient information.

Q. 15. In an experiment student gathers following data while running up a flight of steps on a staircase. Use this to calculate power utilised by the student.

Number of steps = 27

Height of each step = 20 cm

Time taken = 5.4 s

Mass of student = 55 kg

- ① 400 w
- ② 1,485 w
- ③ 539 w
- ④ 664 w

Q. 16. Which of the following is not an example of transverse wave?

- ① Light emitted by CFL
- ② TV signal from satellite
- ③ Ripples on the surface of a pond
- ④ Musical notes of an orchestra

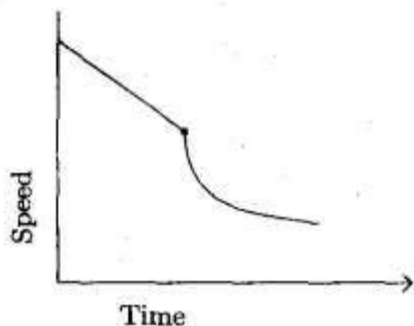
Q. 17. The inner surface of thermos flask is silvered to shine like mirror. This prevents heat exchange due to _____.

- ① radiation
- ② absorption
- ③ conduction
- ④ convection

Q. 18. Electromagnetic induction can be explained as -

- ① Increased magnetic field resulting in increased electric current
- ② Phenomenon of simultaneous existance of electric and magnetic field
- ③ Phenomenon of change in magnetic field generating electric current
- ④ Depletion of electric field due to increase in magnetic field

Q. 19. The graph represents which type of motion?



- ① Retarding
- ② Non-uniformly retarding followed by uniform retardation
- ③ Non-uniformly retarding
- ④ Uniformly retarding followed by non-uniform retardation

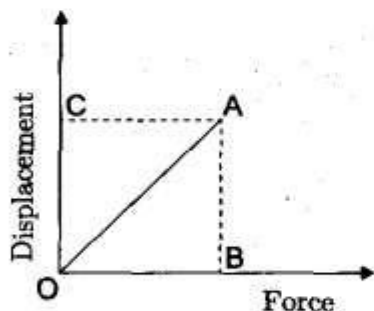
Q. 20. Which wave consists of compressions and rarefaction?
① Transverse ② Light wave ③ Longitudinal ④ X-ray

Q. 21. Four balls A, B, C, D displace 10 ml, 24 ml, 15 ml and 12 ml of liquid respectively, when immersed in it completely. Which ball will undergo maximum apparent loss in weight?
① A ② B ③ C ④ D

Q. 22. A car is travelling 20 m/s along a road. A child runs out on the road 50 m ahead and the car driver steps on brake pedal. What must be car's deceleration if the car is to stop just near the child?
① 4 m/s² ② 2.5 m/s² ③ 1 m/s² ④ 0.2 m/s²

Q. 23. While designing a submarine which of the following laws/principles is used?
① Boyle's law ② Archimedes' principle
③ Law of gravitation ④ Surface tension principle

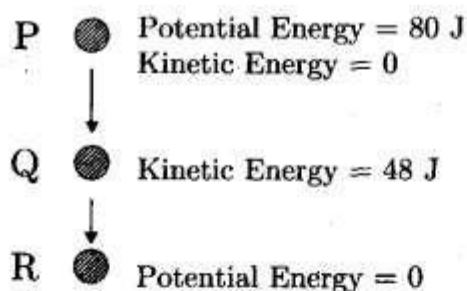
Q. 24. Observe the graph and select the *correct* option to calculate the work done.



- ① 2 (Area □ of OBAC) ② 2 (Area of Δ OAB)
③ Area of □ OBAC ④ Area of Δ OAB

Q. 25. Life of a battery-cell depends upon _____.
① its size
② humidity of surrounding atmosphere
③ the rate of chemical reaction inside
④ quality of packaging

Q. 26. A ball falls to ground as shown below.



What is kinetic energy at R and potential energy at Q?

- ① 80 J, 32 J ② 0 J, 32 J ③ 40 J, 40 J ④ 0 J, 40 J

Q. 27. What will be the angle between force and displacement if work done is negative?

- ① 0° ② 45° ③ 90° ④ 180°

Q. 28. In which of the following options magnets are used?

- ① Stethoscope ② Battle tank
③ Sonography machine ④ MRI machine

Q. 29. A massive truck is parked along the flat road side. Probably it will not move if pushed by a student of 9th class. Justify this.

- ① Two equal and opposite forces cancel each other.
② Force applied on truck is much smaller than the force of friction between wheels of truck and road.
③ Axis of rotation of tyre and direction in which force is applied are different.
④ As truck is on a plane road, its very high potential energy can not be converted into required kinetic energy.

Q. 30. Periscope is based on the principle of _____.

- ① reflection ② refraction
③ multiple reflection ④ multiple refraction

Q. 31. Choose the *incorrect* statement with reference to states of matter.

- ① Closer the particles, harder is the substance.
② Nothing can stop gases from moving apart.
③ Fluidity of liquid depends on its viscosity.
④ Specific gravity affects viscosity.

Q. 32. What was the thickness of Gold foil used in Rutherford's experiment?

- ① 1×10^{-4} cm ② 4×10^{-6} cm
③ 4×10^{-2} cm ④ 0.004 cm

Q. 33. Who am I?

My atomic number is 19.

- ① A solid non-metal of valency 2. ② A gas of valency 2.
③ A metal of valency 1. ④ A non-metal of valency 4.

Q. 34. Photosynthesis is _____ process.

- ① an exothermic ② an endothermic
③ a combustion ④ an oxidation

Q. 35. Mass of one Nitrogen atom is _____

- ① 6.022×10^{23} kg ② 6.022×10^{-23} kg
③ 2.325×10^{-23} kg ④ 2.325×10^{-26} kg

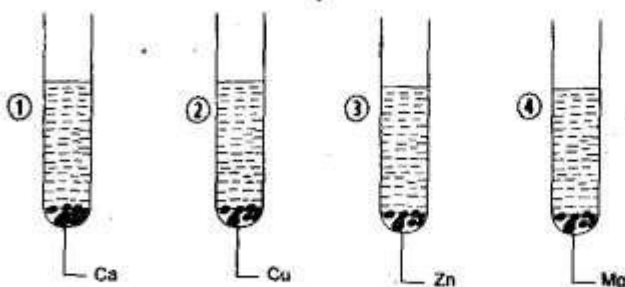
Q. 36. Choose the odd one out on the basis of type of mixture.

- ① Calamine solution ② Milk ③ Hair spray ④ Smoke

Q. 37. What is oil of vitriol?

- ① Aqua regia ② H_2SO_4 ③ HNO_3 ④ HCl

Q. 38. The figure shows test tubes containing acid with metal filings as shown. Observe the tubes and select the one which will show minimum bubble formation.



Q. 39. Why do soft drinks give tingling sensation on teeth?

- ① Citric acid reacts with Calcium in teeth.
② Acetic acid present as a preservative, carries out the reaction.
③ Carbonic acid reacts with enamel of teeth.
④ The colour in the soft drink makes a coat on teeth and creates sensitivity.

Q. 40. Which of the following will show colour change in both acidic and alkaline medium?

- ① Red litmus ② Phenolphthalein ③ Turmeric ④ Methyl orange

Q. 41. For ${}^{52}_{24}\text{X}$, number of electrons is _____.

- ① 52 ② 24 ③ 76 ④ 28

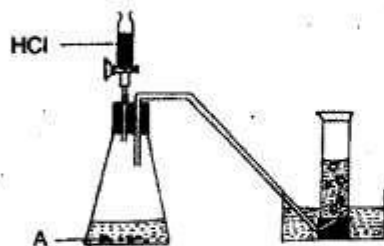
Q. 42. What are bucky tubes?

- ① Graphite tubes ② Inter particle spaces in coal
③ Carbon nanotubes ④ crystal lattice in Diamond

Q. 43. The smoke of *dhoop* stick spreads in next room also. This is an example of _____.

- ① Tyndall effect ② diffusion ③ conduction ④ suspension

Q. 44. Observe the following set up for collection of CO_2 in laboratory. What can be 'A' of the following?



- ① Alum ② Rock salt
③ Chalk powder ④ Common salt

Q. 45. Choose the element that does not show variable valency.

- ① Lead ② Copper ③ Iron ④ Zinc

Q. 46. Number of moles in 500 mg of CO_2 is _____.

(Atomic mass of C = 12, Molecular mass of O_2 = 32)

- ① 1.1364×10^{-2} mol ② 6.022×10^{23} mol
③ 44 mol ④ 1.364×10^2 mol

Q. 47. When Cu reacts with concentrated H_2SO_4 , which of the following statements does not hold true?

- ① Sulphur dioxide is produced ② Copper sulphate is formed
③ One of the by-products is water ④ Oxygen is evolved

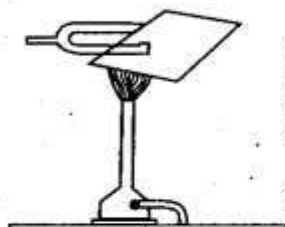
Q. 48. Element 'X' has 8 protons and 8 neutrons in its nucleus. Element 'Y' has 9 protons and 7 neutrons in its nucleus. Select the correct statement for 'X' and 'Y'.

- ① Both are metals ② Both are isotopes
③ Both are isobars ④ Both option 1 and option 2

- Q. 49. Arrange the following in descending order of Carbon content.
 a. Anthracite b. Bituminous c. Lignite d. Peat
- ① a, b, c, d ② b, c, a, d ③ c, a, d, b ④ a, d, c, b

- Q. 50. What will be the product/products for the following reaction?
 $\text{SO}_2 + \text{H}_2\text{O} \rightarrow \underline{\hspace{2cm}}$
- ① H_2SO_4 ② $\text{SO}_2\uparrow + \text{H}_2\uparrow$ ③ H_2SO_3 ④ $\text{H}_2\text{S}\uparrow + \text{O}_2\uparrow$

- Q. 51. Observe the following figure. The paper held on flame is dipped in a mixture of water and alcohol. Select the correct option for the same.



- ① Alcohol will burn and paper will burn immediately.
 ② Water will not evaporate and paper will not burn.
 ③ The ignition temperature of paper will be achieved faster.
 ④ Mixture of alcohol and water will evaporate and prevent paper from burning immediately.
- Q. 52. $2\text{Pb}(\text{NO}_3)_2 \xrightarrow{\Delta} 2\text{PbO} + 4\text{NO}_2\uparrow + \text{O}_2\uparrow$
 This is a _____ reaction.
- ① displacement ② decomposition
 ③ double decomposition ④ combination
- Q. 53. If in a compound 'MX', 'M' is ferrous and 'X' is sulphide, then molecular formula of 'MX' is _____.
- ① FeSO_4 ② $\text{Fe}_2(\text{SO}_3)_3$ ③ Fe_2S_3 ④ FeS
- Q. 54. What is the colour of Methane flame?
 ① Blue ② Yellow ③ Red ④ Green
- Q. 55. Choose the incorrect statement from the following.
- ① Generally oxides of metals are basic.
 ② All alkalies may not be bases but all bases are alkalies.
 ③ Generally oxides of non-metals are acidic.
 ④ Salts formed from reaction between strong acid and weak base are acidic.
- Q. 56. The brown spots we observe on roasting of *chapati* are an example of _____.
- ① dehydration ② vaporisation ③ sublimation ④ burning

Q. 57. To complete the octate, outer most shell of Aluminium _____

- ① loses two electrons ② gains three electrons
③ loses three electrons ④ shares four electrons

Q. 58. What is wood made of?

- a. Humus b. Cellulose c. Lignin
① a and b ② a, b and c
③ a and c ④ b and c

Q. 59. Glass is a _____.

- ① compound ② mixture ③ solid ④ ② and ③ both.

Q. 60. Which of the following is used to find out age of fossils?

- ① C^{14} ② C^{60} ③ C^{12} ④ C^{13}

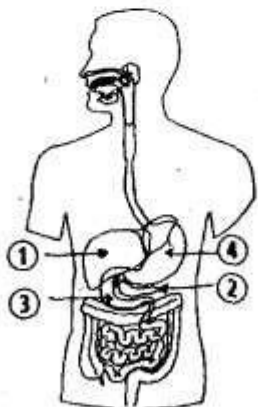
Q. 61. Which of the following will show presence of a nucleoid?

- ① Aspergillus ② Mould ③ Clostridium ④ Volvox

Q. 62. Which of the following is not used as a source of edible oil?

- ① Soyabean ② Flaxseed ③ Olive ④ Horse gram

Q. 63. Select the organ which helps in regulation of blood sugar level.



- ① 1 ② 2
③ 3 ④ 4

Q. 64. Identify the odd one out on the basis of vegetative propagation.

- ① Colocasia ② Anthurium ③ Nephrolepis ④ Yam

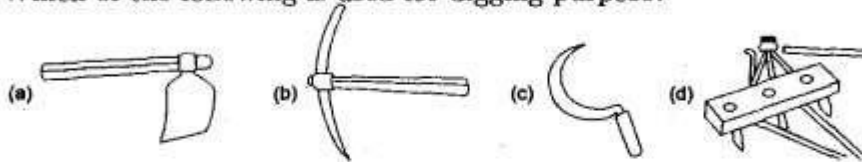
Q. 65. Choose the correct option.

- ① Insulin \rightarrow Glucose + Amino acids ② Lipids \rightarrow Fatty acids + Glycerol
③ Amino acids + Cellulose \rightarrow Glycogen

- ④ Fatty acids + Amino acids → Glycerol
- Q. 66. During festivals, to decorate main door of the house with *Toran*, leaves of which of the following plant are used?
- ① Rosa gallica ② Ocimum sanctum
③ Mangifera indica ④ Hibiscus rosa sinensis

- Q. 67. Why should people suffering from kidney stone should avoid consumption of tomato?
- ① It contains tiny seeds ② It contains Oxalic acid
③ It contains fibres ④ It contains Calcium

- Q. 68. Which of the following is used for digging purpose?



- ① a and b both ② Only b ③ b and c both ④ a, b, c and d

- Q. 69. Why are human RBCs biconcave and circular in shape?
- ① To accommodate more haemoglobin.
② To make up for lost nucleus.
③ To pass easily through blood vessels.
④ To reduce Oxygen consumption.

- Q. 70. Identify the tissue that stores food in potato.
- ① Companion cells ② Parenchyma cells
③ Collenchyma cells ④ Intercalary meristem

- Q. 71. Identify the odd one out on the basis of host organ.
- ① Pin worm ② Hook worm
③ Round worm ④ Filarial worm

- Q. 72. Choose the correct sequence for organisation of living things.
- ① Tissue → Cell → Organ → System
② Community → System → Biosphere → Ecosystem
③ Cell → Tissue → System → Organ
④ System → Community → Ecosystem → Biosphere

- Q. 73. Choose the *incorrect* statement from the following.
- ① Manure adds humus to soil.
② Manure contains lots of plant nutrients.
③ Excessive use of fertilizer makes soil infertile.

④ Manure enhances water holding capacity of soil.

Q. 74. Few cells and more matrix is present in _____.
① bone ② stomach ③ brain ④ heart

Q. 75. Choose the correct option for Triple vaccine.
① Tetanus, Polio, Measels ② Diphtheria, Tetanus, Whooping cough
③ T.B., Polio, Whooping cough ④ Diphtheria, Hepatitis, Tetanus

Q. 76. Choose the *incorrect* statement for pyrolysis of waste materials.
① It can generate gas ② It can generate electricity
③ This process requires Oxygen ④ It generally uses semi-combustible waste

Q. 77. During tissue damage which of the following makes cells resistant to viral infection?
① Histamine ② Plasma ③ Auxin ④ Interferon

Q. 78. Choose the *correct* option for shape of lactobacilli.



Q. 79. Identify the organelle which brings about detoxification process in liver.
① Lysosome ② Golgi apparatus
③ Endoplasmic reticulum ④ Nucleolus

Q. 80. Identify the non-flowering, non-vascular plant among the following.
① Chara ② Pine ③ Adiantum ④ Lycopodium

Q. 81. Insects have _____ and _____.
① 2 wings, 4 appandages ② 4 wings, 6 appandages
③ 2 wings, 6 appandages ④ 4 wings, 4 appandages

Q. 82. Identify the viral disease among the following.
① Measles ② Cholera ③ Malaria ④ Typhoid

Q. 83. Select the odd one out on the basis of food preservation.
① Sodium chloride ② Sucrose
③ Acetic acid ④ Lactic acid

- Q. 84.** Which of the following glands regulates lengthening of bones?
① Thyroid ② Thymus ③ Pituitary ④ Pineal
- Q. 85.** Identify the odd one out on the basis of circulatory system.
① Nereis ② Balanoglossus ③ Myxine ④ Octopus
- Q. 86.** Arrange the following in ascending order of energy availability.
a. Tiger b. Vulture c. Deer d. Pitcher plant
- ① b, a, c, d ② c, b, a, d ③ b, a, d, c ④ d, c, b, a
- Q. 87.** The Phylum level of classification in animals corresponds to which level in plant classification?
① Order ② Division ③ Family ④ Class
- Q. 88.** The size of cell depends on_____
① size of the organism ② its shape
③ its function ④ its location
- Q. 89.** Presence of_____ in the cells of bark of tree prevents exchange of gases and water.
① lignin ② suberin ③ cellulose ④ chitin
- Q. 90.** Dr. Norman Borlaug, 'Father of the Green Revolution', carried out his experiments on_____ plants.
① sugar cane ② cotton ③ wheat ④ soyabean
- Q. 91.** Which of the following sanctuaries is known as 'Bharatpur of Maharashtra'?
① Karnala ② Maldhok
③ Navegaonbandh ④ Nandur Madhyameshwar
- Q. 92.** Oscar Pistorious, the first disabled athlete used which of the following prosthetic legs at London Olympics 2012?
① Silicon fibre blades ② Jaipur foot
③ Carbon fibre blades ④ Artificial ankle joint
- Q. 93.** Agni V is which type of missile?
① Anti ballistic missile ② Intermediate range ballistic missile
③ Tactical ballistic missile ④ Inter continental ballistic missile
- Q. 94.** Generally, the noise level of a domestic refrigerator is_____
① 45–50 dB ② 100–105 dB ③ 25–30 dB ④ 90–95 dB

- Q. 95.** What is the medicinal use of catechu?
① Fever ② Diarrhoea ③ Headache ④ Jaundice
- Q. 96.** Fire alarm is activated in which of the following situations?
① Smoke, CO, flame ② Heat, sound, flame
③ Vibration, heat, CO₂ ④ Water flow, vibration, smoke
- Q. 97.** In which of the following states hornbills are threatened due to their use for making traditional headgear?
① Sikkim ② Odisha ③ Arunachal Pradesh ④ Assam
- Q. 98.** Which of the following statements does not hold true for 3G communication?
① It can transfer picture images. ② Data transfer is wireless.
③ Sending text messages started first time with this technology.
④ It does require separate frequency band.
- Q. 99.** What is the mass of Higgs particles?
① Same as that of proton.
② 100 to 200 times the mass of proton.
③ Same as that of neutron.
④ 1/100 to 1/200 times of the mass of neutron.
- Q. 100.** Where was the first 'Earth Day' organised?
① Rio de Janeiro ② Geneva
③ USA ④ In 171 countries across the world

Answers with Solutions

- A. 1. (4)
- A. 2. (3) **Explanation:** This question is based on law of inertia. As the train is accelerated, coin moves forward and falls behind the person.
- A. 3. (2)
- A. 4. (3) **Explanation:** Speed = distance travelled/time
 Time required for return journey = 0.4 s
 Hence, time required for one way = 0.2 s
 $1,500 = D/0.2$
 $\therefore D = 300 \text{ m}$
- A. 5. (1) **Explanation:** White colour is a mixture of seven colours. White background helps to get the shade of the desired colour come up in a better way.
- A. 6. (4) **Explanation:** Static electricity can create electric field. As the charge is very weak, field created is also weak.
- A. 7. (2) **Explanation:** The diagram shows a spring balance having a zero error of 5 g. Hence weight is actually 20 g. As the object has density 2 g/cm³, water displaced will be 10 ml.
- A. 8. (3) **Explanation:** Sound wave, being a longitudinal wave, has maximum speed in solid and minimum in air.
- A. 9. (1) **Explanation:** If we look at phenomena given in the question - humidity, which is nothing but amount of water vapour present in air, rules predominantly even over surface area.
- A. 10. (3)
- A. 11. (2) **Explanation:** The screen is so far away from the object that the umbra can not be formed on it. Hence no shadow will be formed by aeroplane on the ground.
- A. 12. (4) **Explanation:** $w = mg$
 $\therefore g = 0$ exactly at the centre of the Earth.
- A. 13. (2) **Explanation:** As the animal is small, it has small mass, due to which it has less momentum. Injury is a rare possibility. Injury is related to impact, after collision. Hence these three words are most appropriate.
- A. 14. (2) **Explanation:** Tube P has liquid 1 and tube C has liquid 2. Tube C is open at one end. Hence this arm will experience atmosphere pressure. Thus, the difference in two arms show difference in atmospheric pressure and pressure of liquid 1 in tube P.
- A. 15. (3) **Explanation:** Power = $w/t = m \times a \times s/t$
 Power = $55 \times 9.8 \times 27 \times 20/5.4 \times 100$
 Power = 539 w
- A. 16. (4)
- A. 17. (1) **Explanation:** As mirror has shining surface, it radiates all the heat inside the container. Thus heat remains trapped inside the flask and keep the contents hot for a longer period of time.

- A. 18. (3) **Explanation:** In electromagnetic induction there is change in magnetic field leading to electric current. Induction means without actual contact.
- A. 19. (4) **Explanation:** The first part of the graph having straight line, indicates that, as time progresses, speed decreases and the latter curved path shows non-uniformity.
- A. 20. (3)
- A. 21. (2) **Explanation:** Apparent loss in weight is directly proportional to liquid displaced. Hence ball B which has displaced 24 ml of liquid will undergo maximum apparent loss in weight.
- A. 22. (1) **Explanation:** $v^2 = u^2 + 2a \times s$
 $0 = 400 + 2 \times a \times 50$
 $\therefore a = -4 \text{ m/s}^2$
 Negative sign shows retardation.
- A. 23. (2) **Explanation:** Submarine is submerged in water. Hence Archimedes' principle is helpful in designing a submarine.
- A. 24. (4) **Explanation:** As force and displacement both are vectors, the vector product of force and displacement is work i.e. area of ΔOAB .
- A. 25. (3) **Explanation:** A battery cell consists of several chemicals. The reaction gives us the potential difference. Hence its life depends upon the rate of chemical reaction.
- A. 26. (1) **Explanation:** Total Energy (T. E.) = Kinetic Energy + Potential Energy
 \therefore At P \rightarrow T. E. = $80 + 0 = 80 \text{ J}$
 At Q \rightarrow T. E. = $48 + 32 = 80 \text{ J}$
 At R \rightarrow T. E. = $0 + 80 = 80 \text{ J}$
- A. 27. (4) **Explanation:** If displacement is in the opposite direction of force, then work done is negative. Hence when angle between force and displacement is 180° , work done is negative.
- A. 28. (4) **Explanation:** MRI is Magnetic Resonance Imaging. Stethoscope and Sonography machine work on the principle of reflection of sound. In battle tank there is a conveyor belt.
- A. 29. (2) **Explanation:** When truck is stationary, frictional force is maximum. If a student tries to move this truck, his force cannot overcome the frictional force. Hence, truck will not move.
- A. 30. (3)
- A. 31. (2) **Explanation:** Walls of the container in which the gas is present, limit the movement of gas molecules. Hence, they can stop gases from moving apart.
- A. 32. (4)
- A. 33. (3) **Explanation:** Electronic configuration of an element having atomic number 19 would be 2, 8, 8, 1. It will be easier for that element to give away one electron to stabilise the outer shell. Hence, the element will be an electron donor i. e. a metal with valency 1.
- A. 34. (2) **Explanation:** Solar energy is trapped by plants and utilized in production of glucose.

- A. 35. (4) Explanation:** Atomic mass of Nitrogen = 14 g per gram atom.
 $1 \text{ g atom} = 6.022 \times 10^{23} \text{ atoms}$
 $\therefore 6.022 \times 10^{23} \text{ atom} = 14 \text{ g}$
 $\therefore 1 \text{ atom} = \frac{14}{6.022 \times 10^{23}}$
 $= 2.325 \times 10^{-23} \text{ g}$
 $= 2.325 \times 10^{-26} \text{ kg}$
- A. 36. (1) Explanation:** Calamine solution is a suspension whereas other three are homogeneous mixtures whose particles do not settle on standing.
- A. 37. (2)**
- A. 38. (2) Explanation:** Copper being least reactive will show least bubble formation. Rest will show more. The bubbles will be of Hydrogen gas released on reaction of metals with acids.
- A. 39. (3) Explanation:** Carbonic acid reacts with enamel of teeth.
- A. 40. (4) Explanation:** Red litmus turns blue in alkaline solution only. Phenolphthalein turns reddish pink only in alkaline solution. Turmeric turns pink in alkaline solutions. Methyl orange turns orangish pink in acidic solutions and yellow in alkaline solution.
- A. 41. (2) Explanation:** Atomic number = Number of protons = Number of electrons.
- A. 42. (3)**
- A. 43. (2)**
- A. 44. (3) Explanation:** Chalk powder is Calcium carbonate which will react with HCl and give out CO_2
 $\text{CaCO}_3 + 2 \text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2 \uparrow$
- A. 45. (4) Explanation:** Atoms of some elements loose or gain electrons under different conditions. Hence they have more than one valency. Such several valencies these elements show are called variable valaneies. In the question Zn does not such variable valency. But Cu (Cu^+ , Cu^{++}), Pb (Pb^{++} , Pb^{++++}) and Fe (Fe^{++} , Fe^{+++}) show variable valancies.
- A. 46. (1) Explanation:** Molecular mass of $\text{CO}_2 = 44$,
 $500 \text{ mg} = 0.5 \text{ g}$.
 $\therefore n = 0.5/44 = 1.1364 \times 10^{-2} \text{ mol}$
- A. 47. (4)**
- A. 48. (3) Explanation:** Atomic mass number (No. of protons + No. of neutrons) of both X and Y is same. Hence they are isobars. Their atomic numbers (No. of protons) being different they are not isotopes. Electronic configuration of X would be 2, 6 and that of Y would be 2, 7. Hence both would not donate electrons and are not metals.
- A. 49. (1) Explanation:** Anthracite, Bituminous, Lignite and Peat coal contain 80%, 60%, 22% and 11% coal respectively.
- A. 50. (3) Explanation:** H_2SO_3 (Sulphurous acid).

- A. 51. (4)
- A. 52. (2) **Explanation:** Compound Lead nitrate is broken into smaller units. Hence it is a decomposition reaction.
- A. 53. (4) **Explanation:** Valency of Ferrous is Fe^{2+} and that of Sulphide is S^{2-} . Hence compound MX will be FeS .
- $$\begin{array}{cc} \text{Fe} & \text{S}^{2-} \\ \swarrow & \searrow \\ 2^+ & 2^- \end{array}$$
- A. 54. (1)
- A. 55. (2) **Explanation:** Most bases are insoluble in water and do not release hydroxyl ion (OH^-). But alkalis are bases which are soluble in water and release (OH^-) ions in water.
eg. Sodium hydroxide is an alkali, it dissolves in water to give OH^- ions but Na_2O , Sodium oxide is a base, insoluble in water.
- A. 56. (4)
- A. 57. (3) **Explanation:** Atomic number of Aluminium is 13. Hence its electronic configuration is 2, 8, 3. It is thus an electron donor, with valency 3.
- A. 58. (4) **Explanation:** Cell wall of plant cells is made up of cellulose and in wood the cell wall is thickened due to presence of lignin. Humus is a product of decomposition of plant material. Hence it is absent in wood.
- A. 59. (2) **Explanation:** Glass is a mixture and highly viscous fluid.
- A. 60. (1) **Explanation:** C^{14} is a radioactive isotope of Carbon. A fixed proportion of living tissue is C^{14} . Hence by calculating the amount of C^{14} present in the fossil, we can judge the age of the fossil with knowledge of half life of C^{14} .
- A. 61. (3) **Explanation:** Nucleoid is a characteristic feature of prokaryotes. Clostridium is a bacterium which is prokaryote. Rest three are eukaryotic species.
- A. 62. (4)
- A. 63. (2) **Explanation:** Pancreas produces two hormones, namely, glucagon and insulin. Glucagon enhances blood sugar level while insulin reduces it. Thus, both together regulate blood sugar level.
- A. 64. (3) **Explanation:** In nephrolepis, vegetative propagation takes place by subaerial stem whereas in others it happens via underground stem.
- A. 65. (2) **Explanation:** Lipids are digested to fatty acids and glycerol. This marks the end of lipid digestion. Rest all are incorrect reactions.
- A. 66. (3)
- A. 67. (2) **Explanation:** Oxalic acid promotes crystal formation which may aggravate the disease. Hence patients are advised to avoid tomato in diet.
- A. 68. (1) **Explanation:** For digging only pickaxe is insufficient when it comes to carrying away the dug-out soil.
- A. 69. (3) **Explanation:** To accommodate more haemoglobin, the nucleus disappears on maturity. Hence the answer.
- A. 70. (2)
- A. 71. (4) **Explanation:** Rest of the three live in stomach whereas filarial worm under skin causes elephantitis/ filariasis.

- A. 72. (4)
- A. 73. (2) **Explanation:** Manure contains balanced or moderate amount of nutrients along with humus.
- A. 74. (1) **Explanation:** Bone is a type of connective tissue, which is characterised by presence of large amount of matrix and few cells.
- A. 75. (2)
- A. 76. (3) **Explanation:** In pyrolysis waste material is heated at high temperature, and it does not require Oxygen.
- A. 77. (4) **Explanation:** Plasma contains macrophages and antibodies. Macrophages and other WBCs produce interferon which makes body cells resistant to viruses during infection.
- A. 78. (2) **Explanation:** Bacteria are classified according to shape as follows - Cocci - spherical, bacilli - rod shaped, vibrio - comma shaped and spirilli - spiral in shape.
- A. 79. (3) **Explanation:** Smooth endoplasmic reticulum in liver brings about detoxification process in liver cells.
- A. 80. (1) **Explanation:** Chara is a non-flowering, non-vascular plant. Among the other options, adiantum and lycopodium are non-flowering, vascular plants while, pine is a vascular, flowering variety.
- A. 81. (2)
- A. 82. (1)
- A. 83. (4)
- A. 84. (3) **Explanation:** The Somatotropin or growth hormone secreted by pituitary gland brings about lengthening of bones. Hence oversecretion of growth hormone in childhood leads to gigantism.
- A. 85. (2) **Explanation:** Rest three have closed circulatory system.
- A. 86. (1) **Explanation:** As we go higher in food chain, energy available goes on decreasing. Vulture being a scavenger receives least amount of energy.
- A. 86. (2)
- A. 88. (3)
- A. 89. (2)
- A. 90. (3)
- A. 91. (4)
- A. 92. (3)
- A. 93. (2)
- A. 94. (1)
- A. 95. (2)
- A. 96. (1)
- A. 97. (3)
- A. 98. (3) **Explanation:** Text message has been an inherent feature of mobile phones even before 3G technology was launched.
- A. 99. (2)
- A. 100. (3)