

Guess Paper – 2014
Class – IX
Subject – Science

- 1] Name any two factors responsible for the formation of soil. [Marks:1]
- 2] Identify the kind of energy possessed by a running athlete. [Marks:1]
- 3] What would be the amount of work done on an object by a force, if the displacement of the object is zero ? [Marks:1]
- 4] Write the full form of CFC. [Marks:1]
- 5] (i) State the law of constant proportions. [Marks:2]
(ii) Show that water illustrates the law of constant proportions.
- 6] Composition of the nuclei of two atomic species A and B are given as under :
- | | | | |
|----------|----|----|-----------|
| | A | B | |
| Protons | 17 | 17 | |
| Neutrons | 18 | 20 | [Marks:2] |
- (i) What are the mass numbers of A and B ?
- (ii) How are they related to each other ?
- 7] (i) Write one main characteristic feature that differentiates Gymnosperms from Angiosperms. [Marks:2]
(ii) Give one example of each of a Gymnosperm and an Angiosperm.

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- 8] (i) Identify the class of animals having the following characteristic features.
(a) The warm blooded animals that lay eggs and have four chambered heart and a covering of feathers. [Marks:2]
(b) The cold blooded animals having scales and they breathe through lungs.
(ii) Give one example of an animal belonging to each of these classes.
- 9] (i) Define is pressure. [Marks:2]
(ii) Why is it easy to walk on sand with flat shoes, than with high heel shoes ?
- 10] (i) Define buoyant force. [Marks:2]
(ii) Mention any two factors affecting the buoyant force.
- 11] Draw a neat labelled structure of human ear, depicting the auditory parts only. [Marks:2]
- 12] Give reasons of the following :
(i) We are lucky that ozone is not stable near the earth's surface. [Marks:2]
(ii) The combustion of fossil fuels increases the amount of suspended particles in air.
- 13] (i) Why is water so necessary for all living organisms ? Mention any two points in support of your answer. [Marks:2]
(ii) 'Water is known as A Wonder Liquid'. Justify this statement by giving any two reasons.
- 14] (i) Define the term 'atomic mass unit'. How is it linked with relative atomic mass ?
(ii) How do we know the presence of atoms if they do not exist independently for most of the elements. [Marks:3]

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- 15] (i) Define Avogadro's number. Why is it also known as Avogadro constant ?
(ii) Calculate the molar mass of Na_2O .
(Given, Na = 23 u; O = 16 u) [Marks:3]
(iii) Find the mass of 10 moles of carbon dioxide
(Given, C = 12 u; O = 16 u)
- 16] (i) Draw a neat diagram of Hydra.
(ii) Label mesoglea and gastrovascular cavity.
(iii) Name the group of animals it belongs to. [Marks:3]
(iv) Name one species of this group that lives in colonies.
- 17] (i) Differentiate between acute and chronic diseases.
(ii) Give one example each of acute and of chronic diseases. [Marks:3]
(iii) Mention any two causes of baby's disease.
- 18] (i) Match the following columns with correct answers :

| Column - I | Column - II |
|-----------------------|--------------|
| (a) Fungal disease | Dengue fever |
| (b) Viral disease | Cholera |
| (c) Protozoan disease | Skin disease |
| (d) Bacterial disease | Malaria |

(ii) Name any one disease caused when the microbes target :
(a) liver (b) lungs [Marks:3]

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19] "Prevention of disease is more desirable than its treatment". Justify the statement by discussing three major strategies to be adopted for the prevention of infectious diseases. [Marks:3]

20] (i) Define Power. Mention its S. I. unit.

(ii) 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. [Marks:3]
(Given , $g = 10 \text{ ms}^{-2}$)

21] (i) What does the acronym SONAR stand for ?

(ii) What is the audible range of sound for human beings ? [Marks:3]

(iii) How do the bats search and catch their prey in dark night ?

22] (i) What causes reverberation of Thunder sound ?

(ii) 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. [Marks:3]

23] (i) Draw a sketch of Bohr's model of an atom with three shells.

(ii) State the rules followed for writing the number of electrons in different energy shells.

OR

(i) What is the drawback of Rutherford's model of an atom ? [Marks:5]

(ii) Mention the postulates Neils Bohr put forth to overcome the objections raised against Rutherford's atomic model.

(iii) 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.

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- 24] (i) Define of potential energy.
(ii) Derive the expression for work done by an object with mass m , when it is to be raised to a height h , from the ground.
(iii) An object of mass 10 kg is at a certain height above the ground. If the potential energy of the object is 400 J, find the height at which the object is with respect to the ground.
(Given, $g = 10 \text{ ms}^{-2}$)

[Marks:5]

OR

- (i) State the law of conservation of energy.
(ii) Define mechanical energy.
(iii) Calculate the energy in kWh consumed in 10 hours by four devices of power 500 W each.
- 25] (i) Make neat and labelled sketch of Nitrogen cycle in nature.
(ii) Describe in brief the role of Nitrogen fixing bacteria and of lightening in fixing atmospheric nitrogen.

OR

[Marks:5]

- (i) Draw a neat labelled sketch of carbon cycle in nature.
(ii) What is green house effect ? How does carbon dioxide cause global warming in the atmosphere ?

- 26] Which one of the following is a correct statement about the mass of a body ?

[Marks:1]

- A. It changes from place to place
B. It is more at the poles than at the equator
C. It decreases as we move the body from Earth's surface to Moon's surface.
D. It remains constant at all places

- 27] When a body is fully immersed in a liquid, it undergoes an apparent :

[Marks:1]

- A. loss in its volume

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- B. loss in its mass
- C. no loss in any respect
- D. loss in its weight

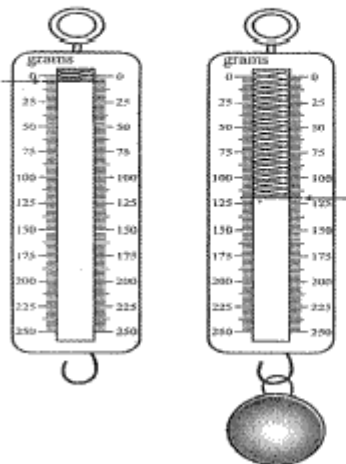
28] A body floats in a liquid : [Marks:1]

- A. when the weight of the body is exactly half of the weight of the liquid displaced.
- B. when the weight of the body is greater than the weight of the liquid displaced.
- C. when weight of the body is less than the weight of the liquid displaced.
- D. when weight of the body is equal to the weight of the liquid displaced.

29] When a body is immersed in a liquid, the buoyant force acts on the body : [Marks:1]

- A. vertically downwards
- B. sideways towards the walls of the container
- C. none of the above
- D. vertically upwards

30] The spring balance shown in the following diagram is used to measure the weight of a given solid. The weight of the solid is :



[Marks:1]

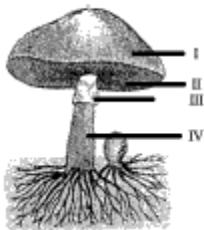
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- A. 110 g
- B. 120 g
- C. 125 g
- D. 100 g

31] You are to find the weight of a solid cube of aluminium of side 4 cm and density 2.7gcm^{-3} . Which one would you consider as the best option for the choice of spring balance ? [Marks:1]

- A. Spring balance with range 0 to 50 g and least count of 1 g
- B. Spring balance with range 0 to 100 g and least count of 1 g
- C. Spring balance with range 0 to 500 g and least count of 2 g
- D. Spring balance with range 0 to 200 g and least count of 1 g

32] A 9th class student is interested to observe pileus of mushroom. Which part he/she should be shown by the label ?



[Marks:1]

- A. II
- B. III
- C. IV
- D. I

33] One common character between mosses and ferns is :

[Marks:1]

- A. dominant sporophytic phase
- B. dominant gametophytic phase
- C. amphibians of plant kingdom

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D. alternation of generation

- 34] Seeds of Pinus have : [Marks:1]
A. two cotyledons
B. three cotyledons
C. one cotyledon
D. none of the above
- 35] Cockroach is : [Marks:1]
A. detritivorous
B. herbivorous
C. carnivorous
D. omnivorous
- 36] Earthworm belongs to the phylum : [Marks:1]
A. chordata
B. arthropoda
C. mollusca
D. annelida
- 37] Gills cover in bony fishes is known as : [Marks:1]
A. fins
B. air bladder
C. cloaca
D. operculum
- 38] Sound waves can travel : [Marks:1]
A. in vacuum only
B. in vacuum as well as in a material medium

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- C. neither in vacuum nor in material medium
- D. in a material medium only

39] In order to perform the experiment on verification of laws of reflection of sound successfully, the reflecting surface should be : [Marks:1]

- A. a wooden board with many holes in it
- B. a foam padded board
- C. a sheet of pure white cloth
- D. a wooden board without holes

40] For finding the velocity of a pulse propagated through a stretched string : [Marks:1]

- A. stop clock could be started at any time depending upon the convenience of the performer.
- B. stop clock should be started after jerk has been given.
- C. stop clock should be started first and then jerk should be given.
- D. stop clock should be started simultaneously when a jerk is given to one end of the string.

41] Sound waves cannot pass through : [Marks:1]

- A. helium gas
- B. air
- C. metallic iron
- D. vacuum

Solutions:

- 1] Sun, water, wind and living organisms (any two)
- 2] Kinetic Energy

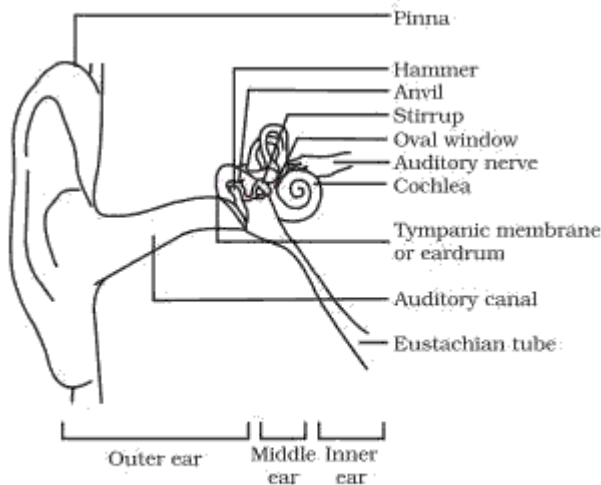
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- 3] Zero
- 4] Chloro Fluoro Carbon.
- 5] (i) In a chemical substance, the elements are always present in definite proportion by mass.
(ii) In pure water, the ratio between the masses of hydrogen and oxygen is 2 : 16 or 1 : 8, which will remain the same, whatever the source of water.
- 6] (i) Mass number of A = 35
Mass number of B = 37
(ii) These two species i.e. A and B are isotopes, as they have the same number of protons in their nuclei.
- 7] (i) Gymnosperms bear naked seeds. In Angiosperms the seeds develop inside an organ (ovary) which is modified to become a fruit.
(ii) Gymnosperm : examples Pines/Deodar (any one)
Angiosperm : Paphiopedilum/ipomoea (any one)
(any other flowering plant)
- 8] (i) (a) Aves
(b) Reptilia
(ii) Aves crow/pigeon (any one)
Reptilia turtle, king cobra (any one) (Any other appropriate example)
- 9] (i) Pressure is thrust per unit area.
- $$\text{Pressure} = \frac{\text{Thrust}}{\text{area}}$$
- (ii) With flat shoes, the weight of our body will act on large area of sand and will produce less pressure on sand so it will not sink in sand. But if we wear shoes with pointed heels, the weight of our body will fall on small area producing large pressure on sand so heels will tend to sink and make walking difficult on sand.

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- 10] (i) The buoyant force is the upward force exerted by the liquid on a body immersed in it.
- (ii) Factors affecting the buoyant force are : (any two to be given)
- (a) Volume of the body immersed in liquid
 - (b) Density of liquid (fluid)
 - (c) Acceleration due to gravity

11]



(any two correct labelling)

- 12] (i) When stable, ozone, means O_3 , which is poisonous, nearer to the earth it is unstable and hence is a diatomic molecule of oxygen.
- (ii) The suspended particles increase due to the unburnt carbon particles or hydrocarbons present in fossil fuels.

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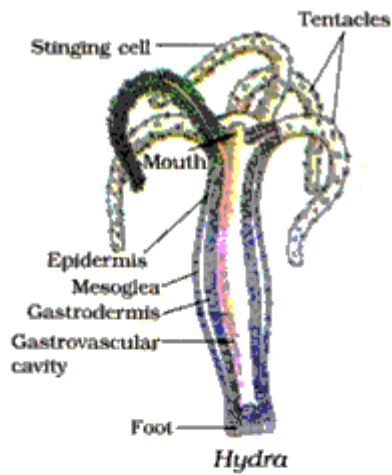
- 13] (i) (a) All cellular processes take place in water medium.
 (b) All reactions that take place within our body and within the cells occur between substances that are dissolved in water.
 (c) Substances are also transported from one part of the body to the other in a dissolved form. (any two)
- (ii) (a) Water occupies very large area of earth's surface.
 (b) It exists in the form of water vapour in the atmosphere.
 (c) Fresh water is found frozen in the ice - caps at the two poles and on snow covered mountains.
 (d) The under ground water and the water in rivers, lakes and ponds is also fresh. (any two)

- 14] (i) One atomic mass unit is a mass unit equal to exactly $\frac{1}{12}$ th the mass of one atom of C-12.
 The relative atomic mass of the atom of an element is the average mass of the atom, as compared to $\frac{1}{12}$ th the mass of one carbon - 12 atom.
- (ii) Atoms of most elements are not able to exist independently. However, they form molecules and ions, which aggregate in large numbers to form matter which we can see, feel or touch and hence we know of their presence.

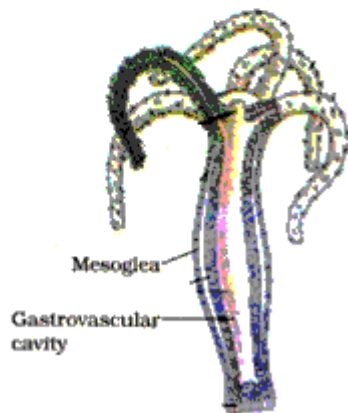
- 15] (i) The number of particles (atoms, molecules of ions) present in one mole of any substance is called Avogadro's number.
 This number is known as Avogadro constant because its value is fixed (6.022×10^{23}).
- (ii) $2 \times$ atomic mass of sodium + atomic mass of oxygen
 $2 \times 23u + 16u = 62$ g (molar mass).
- (iii) Mass of 1 mole of $\text{CO}_2 = 12u + 32u$
 $= 44$ u
 $= 44$ g (molar mass)
 Mass of 10 moles of $\text{CO}_2 = 44 \times 10$
 $= 440$ g

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16] (i)



(ii)



(iii) Coelenterata (Cnidaria)

(iv) Corals

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- 17] (i) Acute diseases last for only short periods. Where as chronic diseases can last for a long time even as long as life time// Acute disease will not cause major effects on general health whereas chronic diseases have very drastic long - term effects.
- (ii) Examples, Acute diseases : cough, cold, (any one)
Chronic diseases : Elephantiasis, tuberculosis (any one)
- (iii) (a) Poor nourishment
(b) Lack of public services
(c) Virus infection (any two)
- 18] (i)

| Column I | Column II |
|-----------------------|--------------|
| (a) Fungal disease | Skin disease |
| (b) Viral disease | Dengue fever |
| (c) Protozoan disease | Malaria |
| (d) Bacterial disease | Cholera |
- (ii) (a) Jaundice
(b) Cough and breathlessness (any one)
- 19] Major strategies are (to be elaborated in brief)
- (i) Safe drinking water, public hygiene.
(ii) Availability of proper nourishing and sufficient food.
(iii) Immunisation programme.

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- 20] (i) Power is defined as the rate of doing work or rate of transfer of energy. If an agent does a work W in time t , then power is given by :

$$\text{Power} = \frac{\text{Work}}{\text{Time}} \text{ or } P = \frac{W}{t}$$

The S.I. unit of power is Watt (W).

- (ii) Weight of the boy, $mg = 50\text{kg} \times 10 \text{ ms}^{-2}$
 $= 500 \text{ N}$

$$\text{Height of the staircase, } h = \frac{40 \times 15}{100} \text{ m} = 6.0 \text{ m}$$

Time taken to climb , $t = 8 \text{ s}$.

$$\therefore \text{Power (P)} = \frac{\text{Work done}}{\text{time taken}} = \frac{mgh}{t} = \frac{500 \text{ N} \times 6 \text{ m}}{8 \text{ s}} = 375 \text{ W}$$

\therefore Power is 375 W

- 21] (i) Sound Navigation and Ranging.
(ii) 20 Hz to 20,000 Hz.
(iii) The high - pitched ultrasonic squeaks of the bat are reflected from the obstacles or prey and returned to the bat's ear. Such reflections tell the bat where the prey is and what it is like.

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22] (i) It is due to the successive and multiple reflections of the sound from a number of reflecting surfaces, such as the clouds and the land.

(ii) Given,

The distance of the object from the submarine

$$= 3625 \text{ m}$$

distance travelled by the device = $2 \times 3625 \text{ m}$

Time taken in sending out the

signal and to receive back = 5 s

$$\text{speed of sound} = \frac{\text{Distance travelled}}{\text{Time taken}}$$

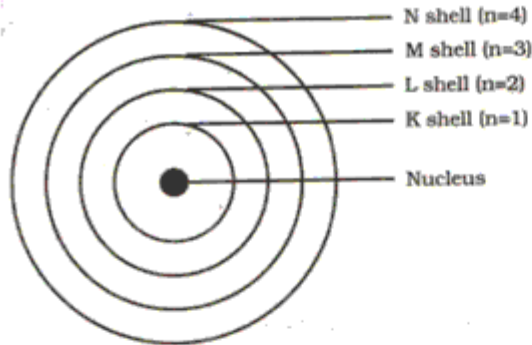
$$= \frac{2 \times 3625 \text{ m}}{5 \text{ s}}$$

$$\text{speed of sound in water} = \frac{2 \times 3625 \text{ ms}^{-1}}{5}$$

$$= 1450 \text{ ms}^{-1}$$

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23] (i)



Correct sketch

Correct labelling of three shells

(ii) rules are :

(a) Maximum number of electrons present in a shell are given by formula $2n^2$ where 'n' is the orbit number :

$$\text{First orbit K shell} = 2 \times 1^2 = 2$$

$$\text{Second orbit L shell} = 2 \times 2^2 = 8$$

$$\text{Third orbit M shell} = 2 \times 3^2 = 18$$

$$\text{Fourth orbit N shell} = 2 \times 4^2 = 32$$

(b) Maximum number of electrons that can be accommodated in outermost orbit is 8.

(c) Electrons are not accommodated in a given shell, unless the inner shells are filled.

OR

(i) According to Rutherford's model of an atom. The atom should be highly unstable and hence matter will not exist in the form we know.

(ii) Bohr put forward the following postulates in order to overcome the objections raised against Rutherford's atomic method.

(a) Only certain special orbits known as discrete orbits of electrons are allowed inside the atom.

(b) While revolving in discrete orbits the electrons do not radiate energy. These orbits or shells are called energy levels.

(iii) The average atomic mass of chlorine atom, on the basis of given data, will be :

$$\begin{aligned} 35 \times \frac{75}{100} + 37 \times \frac{25}{100} &= \frac{105}{4} + \frac{37}{4} \\ &= \frac{142}{4} = 35.5\text{u} \end{aligned}$$

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24] (i) It is the energy present in an object by virtue of its position or configuration .

(ii) Work done (W) = Force \times Displacement
= $mg \times h$
= mgh

Since work done on the object is equal to mgh , an energy equal to mgh units is gained by the object. This is the potential energy (E_p) of the object = mgh .

(iii) Mass of the object, $m = 10 \text{ kg}$
Potential Energy $E_p = 400 \text{ J}$
 $\therefore E_p = mgh$
 $\therefore 400\text{J} = 10 \text{ kg} \times 10 \text{ ms}^{-2} \times h$
thus $h = \frac{400\text{J}}{100 \text{ kgms}^{-2}} = 4 \text{ m}$

The object is at the height of 4.0 m

OR

(i) Law of conservation of energy states.

Energy can only be converted from one form to another. It can neither be created nor destroyed.

The potential energy of an object (with total energy mgh) will decrease as it falls and its kinetic energy will increase.

Sum total of potential energy and kinetic energy will therefore remain constant.

$$\text{potential energy} + \text{kinetic energy} = \text{constant.}$$

(ii) The sum of kinetic energy and potential energy of an object is called its mechanical energy.

(iii) Power of one electrical device = 500 W
Power of four such electrical devices = $4 \times 500 \text{ W} = 2000 \text{ W}$
= 2k W

Time taken = 10 hours
Since energy = Power \times time taken
= $2 \text{ kW} \times 10 \text{ h}$
= 20 kWh

The energy consumed by the four devices = 20 kWh

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25] (i)



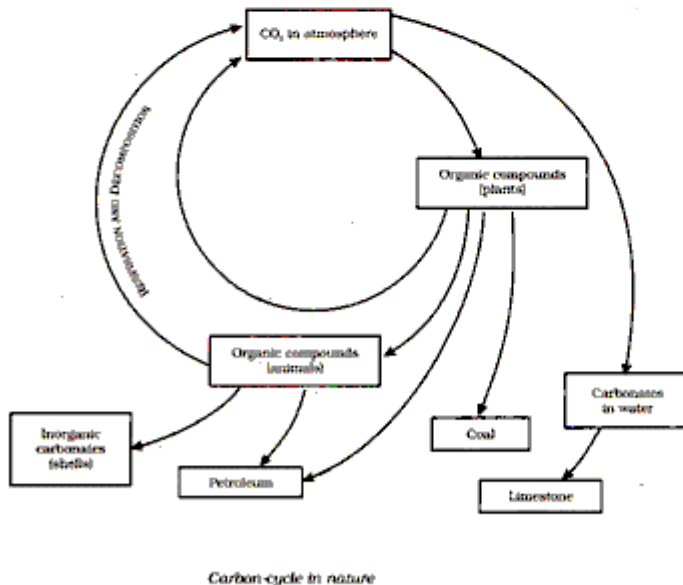
(ii) Nitrogen - fixing bacteria (may be free living or associated with plants/ dicot plants) mostly found in the roots of legume plants convert atmospheric nitrogen molecules into ammonia.

During lightning, the high temperatures and pressures created in the air convert nitrogen into oxides of nitrogen.

These oxides dissolve in water to give nitrous and nitric acids that fall on land along with rain.

OR

(i)



(ii) Green house effect is :

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- 26] It remains constant at all places
- 27] loss in its weight
- 28] when weight of the body is equal to the weight of the liquid displaced.
- 29] vertically upwards
- 30] 100 g
- 31] Spring balance with range 0 to 200 g and least count of 1 g
- 32] I
- 33] alternation of generation
- 34] none of the above
- 35] omnivorous
- 36] annelida
- 37] operculum
- 38] in a material medium only
- 39] a wooden board without holes
- 40] stop clock should be started simultaneously when a jerk is given to one end of the string.
- 41] vacuum



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