SUMMATIVE ASSESSMENT – II SCIENCE / Class – IX Code-JS-003

Time allowed : 3 hours SECTION-A Maximum Marks : 90

1. Write the chemical formula of ammonium sulphate. 1
2. Which in your opinion is more basic characteristics for classifying organism – the place where they live in or the kind of cells they are made of ? 1
3. The atmosphere acts as a blanket. How ? 1
4. List any two differences between pteridophytes and phanerogams 2
5. What is immunization? List two diseases against which vaccines are available. 2
6. (a) State the principle on which the working of a hydrometer is based. (b) A sharp knife is more effective than a blunt knife. Why ? (a) (b) 2
7. Define energy. Name and define its SI unit. S I 2
8. (a) Define atomic mass unit (b) Distinguish between molecular mass and molar mass (c) Give an example of (i) diatomic, (ii) triatomic molecule of compounds. (a) (b) (c) (i) (ii) 3
9. The atomic number and mass number of an element are 16 and 32 respectively. Find the number of protons, electrons and neutrons in it. State its valency. Is this element a metal or a non – metal. Justify your answer. 16 32 3
10. (a) The composition of nuclei of two atomic species X and Y are given below 3

	X	Y
Protons	17	17
Neutrons	18	20

Find the mass number of X and Y. State the relationship between X and Y
(b) The K and L shells of an atom are completely filled. Find the number of electrons present in it. State the name of this element.

11. Write the name used for the following : 3
(a) Plants which bear naked seeds (b) Animals which have pseudococlom
(c) Animals which maintain a certain body temperature over a wide range of temperature in the environment.
12. State any three basis for classification of organisms into five kingdoms. 3
13. Write the full form of AIDS. List four modes of transmission of virus of this disease. 3
14. List two forces which act as on a body when it is immersed in a liquid. State the condition for a body to float or sink in a liquid. Why does an iron nail sink and a place of wood floats when placed on the surface of water. 3
15. A child of mass 35kg is sitting on a trolley of mass 5 kg. The trolley is given a push by applying a force so that begins to move with a speed of 4m/s. The trolley comes to rest after covering a distance of 16 m. Find
(i) the work done on the trolley (ii) the work done by the trolley before coming the nest.
16. (a) An object of mass 'm' is moving with a velocity 'v' on a level ground. State the amount of work done by a person who wants to stop the object. Justify your answer. 3
(b) A satellite of mass 'm' is moving round the earth with a speed 'v'. State the work done by the force of gravity on the satellite. Justify your answer.
17. Define the terms wavelength, frequency, time period and amplitude of a sound wave. How are the wavelength and frequency of a sound wave related to its speed? 3
18. What is soil ? How is it formed ? State the major factor that decides the structure of a soil. What role does it play ? 3
19. What is green house effect? List two green house gases. State the ultimate effect of increase in green house gases in the environment. 3

20. (a) What are polyatomic ions ? Give one example each of polyatomic cation and anion. 3
(b) Find the mass of the following :
(i) 0.5 mole of oxygen gas
(ii) 3.011×10^{23} atoms of oxygen
(iii) 6.022×10^{24} molecules of oxygen (Given atomic mass of 0=16u; $N_o = 6.022 \times 10^{23}$ per mole

OR a) State six postulates of Daltons atomic theory. (b) A 0.24g sample of compound of carbon and oxygen on analysis was found to contain 0.096g of boron and 0.144g of oxygen. Find the percentage composition of the compound by wight

21 (a) State three distinguishing features between the animals belonging to the Aves groups and those in the Mammalia groups. (b) List four conventions followed while writing the scientific names of living organisms 5

OR, (a) List two differences between gynomsperms and angiosperms.
(b) (i) Name the group of plants which have unicellular undifferentiated plants.
(ii) Name the Kingdom in which you will place an organism which is single celled, eukaryotic and photosynthetic.
(iii) Name the group of organism which are eukaryotic, heterotrophic and saproplytie.

22. Define Kinetic energy. Derive an expression for the Kinetic energy possessed by an object of 'm' moving with a velocity 'v' . A light and a heavy object has the same momentum Find the ratio their kinetic energies. Which one has a larger Kinetic energy ? 5

OR, State the law of conservation of energy. Show that the energy of a (i) freely falling object is conserved (ii) vibrating pendulum is conserved.

23. (a) List in tabular form two differences between longitudinal waves and transverse waves. Name a wave which does not require a material medium for its propagation. 5
(b) The speed of a sound wave in air is 339 m/s. If its wavelength is 1.5m what is its frequency ? will it he audible ? Justify your answer.

OR, (a) List three characteristics of sound waves. State the factors an which each of these characteristics depends.
(b) A bat can bear sound of frequencies up to 120 KHz of the speed of sound in air 360 m/s, determine the wavelength of sound at this frequency.

24. (a) Draw carbon cycle in nature. (b) Write the importance of ozone in the atmosphere. 5

OR, (a) Draw water cycle in nature.
(b) Name two chemicals present in the living organism having carbon, hydrogen and oxygen as main constituents. State their main function.

SECTION - B

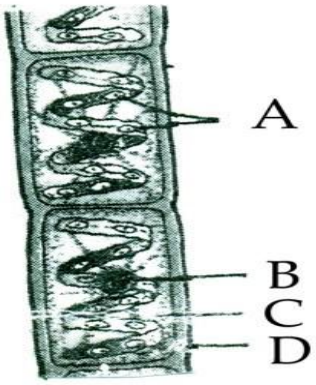
25. A reaction between lead nitrate and sodium chloride was carried in a sealed conical flask. The masses of the reactants (sodium chloride and lead nitrete) and the products (lead chloride and sodium nitrate) were measured carefully. The expected conclusion of the experiment must be :
(a) Mass of lead nitrate = Mass of lead chloride
(b) Mass of sodium nitrate = Mass of sodium chloride
(c) Mass of (lead nitrate + sodium chloride) = Mass of (sodium nitrate +lead chloride)
(d) Mass of (lead nitrate + lead chloride) + Mass of (sodium nitrate + Sodium chloride)

26. To verify the law of conservation of mass in a chemical reaction four students performed the following chemical reactions in the school laboratory
A: Added zinc granules to dilute sulphuric acid
B : Added copper sulphate solution on to sodium carbonate solution
C : Passed carbon dioxide gas through lime water
D : Added lime stone to dilute hydrochloric acid

The student who is likely to get best results is :(a) A (b) B (c) C (d) D

27. Earthworms have which characteristics of Annelid ?
(a) True coelom (b) Open blood vascular system (c) True Segmentation (d) Both (a) and (c)

28. The correct labelling of parts A,B, C and D is



(a) (A) cytoplasm (B)- Chloroplast (C)- Nucleus (D)- Cell wall
(b) (A) - Chloroplast (B) – Nucleus (C) – cytoplasm (D)-Cell wall
(c) (A) – Cell wall (B) – Cytoplasm (C) – Nucleus (D) – Chloroplast
(D) (A) - Chloroplast (B) – Cytoplasm (C) – Nucleus (D) – Cell wall

29. Fins help the fish in -- (a) Respiration (b) Locomotion (c) Steering (d) Both (b) and (c)

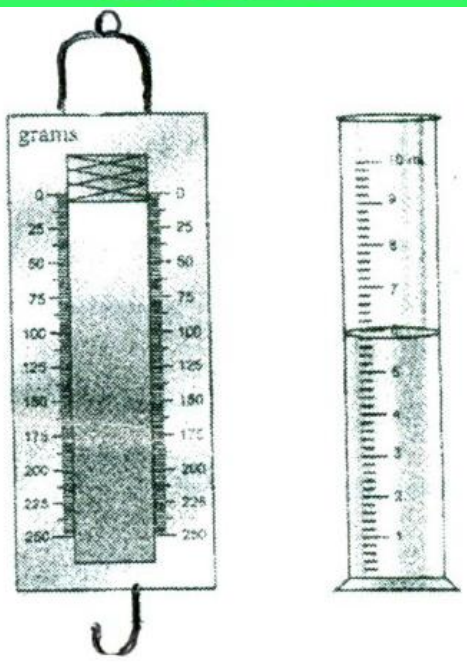
30. Ferns are advanced over mosses because they bear
(a) stem (b) leaves (c) Sporangia (d) Vascular tissue

31. Which of the following is correct observation about the seeds and flowers of gram plants ?
(a) Monocotyledonous seeds and timerous flowers
(b) Monocotyledonous seeds and pentamerous flowers
(c) Dicotyledonous seeds and t timorous flowers
(d) Dicotyledonous seeds and pentamerous flowers

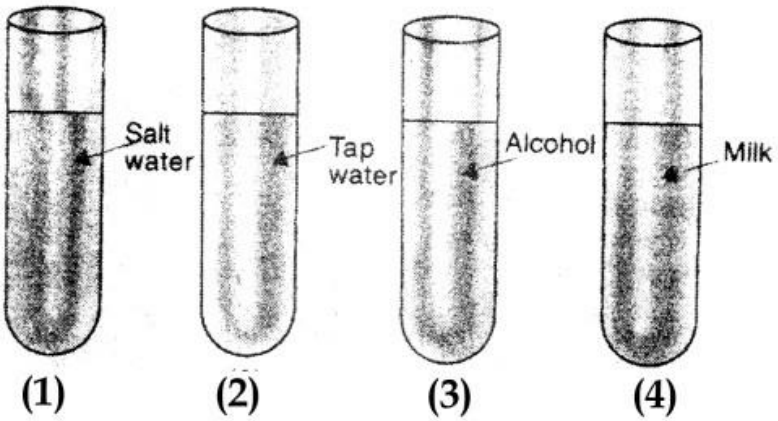
32. When you observe the developmental stages in the life cycle of a mosquito you will notice that the stage in which it moves on the surface of water is (a) adult (b) egg (c) larva (d) pupa

33. You have to determine the weight of a metallic cube of side 4cm an density 9000kg/m3 . out of the following four spring balances the one best suited for this purpose is
(a) Range 0—100gwt; Least count = 1gwt (b) Range 0—500gwt; Least count = 5gwt
(c) Range 0 – 1000gwt; Least count = 10gwt (d) Range 0 – 1000gwt; Least count = 20gwt

34. The magnitude of zero error of the spring balance and least count of the measuring cylinder shown here are respectively
(a) 2.5g and 0.1 ml (b) 5.0g and 0.1 ml (c) 2.5g and 0.2ml (d) 5.0g and 0.2ml

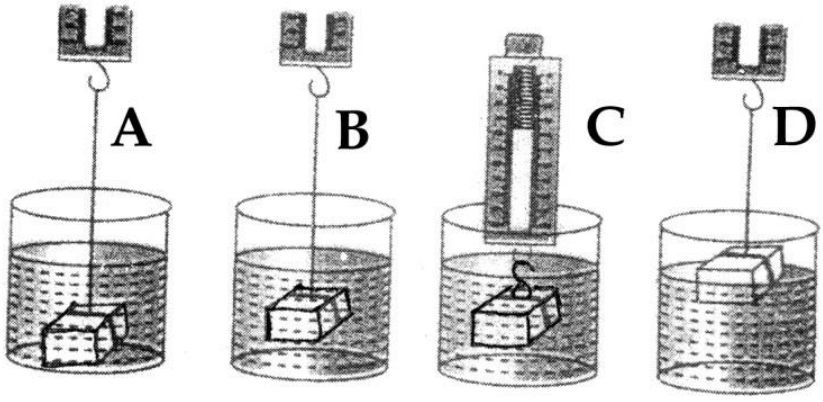


35. If you immerse a body completely in the solutions /liquids filled in the four test tube 1,2,3,and 4 you will observe maximum loss in weight when the body is immersed in the test tube :



(a) 1 (b) 2 (c) 3 (d) 4

36. The correct experimental setup for determining the apparent loss in weight of a body immersed in a liquid is shown in figure (a) A (b) B (c) C (d) D

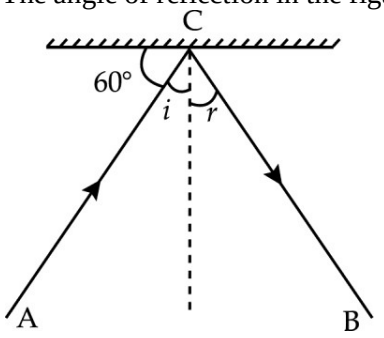


37. A student places an iron cuboid of dimensions 1cm x 4cm x10cm on the loose sand with its side of dimensions (i) 1cm x4cm and (ii) 4cm x 10cm lie on the sand. If the pressures exerted by the cuboid in two cases are P_1 and P_2 respectively then P_1 / P_2 must be (a) 1/4 (b) 4/1 (c) 1/10 (d) 10/1

38. metallic coboid of mass 8 Kg and dimension 4cm x 10cm x 25cm is placed on a table to exert pressure on its surface. If g = 10m/s_2 the maximum pressure which can be exerted by the coboid is
(a) 20000Pa (b) 8000 Pa (c) 4000 Pa (d) 2000 Pa

39. For doing the experiment on verifying the laws of reflection of sound we prefer the hollow cardboard tubes because they make the sound waves
(a) move in straight lines (b) have multiple reflections and prevent spreading of sound
(c) concentrate into a powerful beam (d) travel easily

40. The angle of reflection in the figure depicted is



(a) 60^0 (b) 120^0 (c) 30^0 (d) can be 60^0 or 30^0

41. While doing the experiment on measuring the velocity of a pulse through a stretched string we use a string and fix its one end to a door handle or to a hook on a wall for letter performance we should prefer.
(a) About 2m long thin tightly knit cotton string held very taut.
(b) About 5m long thick loosely knit cotton string held very taut.
(c) About 5m long thick loosely knit jutes string held jutes taut.
(d) About 5m long thick tightly knit cotton string hold just taut.

42. A pulse was created in a slinky of length 8m by a group of four students A,B,C, and D. They observed that it returned after reflection at the point of creation 5 times in 10s and calculated the speed of pulse through slinky is

Student	A	B	C	D
Speed(m/s)	4.0	8.0	12.0	16.0

Solution SUMMATIVE ASSESSMENT – II SCIENCE / Class – IX Code-JS-003

25.	(c)	**32.**	(c)	**39.**	(b)
26.	(b)	**33.**	(c)	**40.**	(c)
27.	(c)	**34.**	(d)	**41.**	(d)
28.	(b)	**35.**	(a)	**42.**	(b)
29.	(d)	**36.**	(b)		
30.	(d)	**37.**	(d)		
31.	(d)	**38.**	(a)		

SECTION: A

1. $(NH_4)_2SO_4$ **1**

2. The kind of cells the organisms are made of **1**

3. Air in the atmosphere is a bad conductor of heat and it keeps the average temperature of the earth fairly steady during the day and the whole year. **1**

4.

	Pteridophytes		Phanerogams	**1+1**
(i)	Do not produce seeds	(i)	Produce seeds	
(ii)	hidden reproductive organs	(ii)	well differentiated reproductive tissues.	
(iii)	Primitive Vascular tissue	(iii)	Advance vascular tissuesr	

5. V = 330 m/s, λ = 0.6m **2**
V = u λ
u = 300/0.6 = 500Hz
As Frequency is between audible range 20Hz – 20kHz, it is audible

6. (a) Greater the density of liquid in which a body is immersed. Lesser is the volume **2**
(b) small area, force will exert more pressure as pressure is inversely proportional to area.

7. The energy possessed by an object is its capacity of doing work in the unit of energy is joule . 1 Joule is the energy required to do 1 Joule of work. **1+½+½**

8. (a) It is mass unit equal to exactly one twelfth (½th) the mass of one atom of carbon – 12 **3**
(b) The molecular mass of a substance is the sum of the atomic masses of all atoms in a molecule where as the mass of 1 mole of any substance is called its molar mass.
(c) Diatomic molecule of a compound : HCI / CO / NO or any other example
Triatomic molecular of a compound : CO_2 / H_2O / SO_2 or any other example.

9. In vibrating pendulum at extreme point and at mean position only PE and in between both PE & KE> **1x3=3**
(a) No. of protons = 16
No. of electrons = 16
No. of neutrons = 16

(b) Electronic configuration 2, 8, 6
Valency = 8-6 = 2

(c) It is a non metal because it has 6 valence electrons

10. (a) Mass number of X = 35 **3**
Mass number of Y = 37
Relationship between the two species since number of protons is same (same atomic number) they are isotopes of same element

(b) Numbers of electrons = 10 $\frac{k}{2}\ \frac{L}{8}$
Name of the element = Neon

11. (a) Warm blooded animals **1x3=3**
(b) Gymnosperms
(c) Ascaris / Nematod

12. (a) Type of cells prokaryotes or eukaryotes **1+1+1=3**
(b) Mode of nutrition
(c) Body organisation

13. Aquired Immuno Deficiency Syndrome **3**
Through sexual contact
Through blood trsnsfusion
From mother to child
Through infected needled or syringes

14. (i) W – weight of the body - acting downward **3**
(ii) U - upthrust by liquid – acting vertically upwards
When W =U or W<U body floats and when W>U body sinks. Iron nail sibs in water because W>U and wood floats on water because W<U.

16. (a) Work done = Kinetic energy = $\frac{1}{2}\ mv^2$ **3**

15. 3

$$K.E = \frac{1}{2}mv^2$$
$$= \frac{1}{2} \times 40kg \times (4m/s)^2$$
$$= 3205.$$

(b) Work done = O because the satellite moves on a circular path and force and displacement are perpendicular to each other $W = F \times s \cos 90° = F \times s \times 0 = 0.$

17. Definition of (i) wavelength (ii) Frequency (iii) time period (iv) amplitude **4x½**
Statement of the ovation v= $\nu\lambda$ **1**

18. Soil : It is a mixture containing small particles rocks and lots of decayed living organism called human.
Formation of soil :-------
Weathering of rocks Major factor – Humus. It makes the soil more process that water penetrates deep underground.

19. The warming up of the atmosphere due to trapped radiation is called green house effect.
Green house gases carbon dioxide methane increase in green house gases will lead to global warming

20. (a) A group of atoms having a charge is known as polyatomic ion, one cation - NH_4^{1+} one anion SO_4^{2-} .

(i) n= 0.5 mole M =16×2 =32g m=?

$$m = 0.5 \times 32$$
$$= 16.0g.$$

(ii) N= 3.011×10^{23} No = 6.022×10^{23} m=? M = 16g

$$N = \frac{N}{N0} \qquad \frac{3.011 \times 10^{23}}{6.033 \times 10^{23}} = \frac{1}{2}$$

m = nxm

$$\frac{1}{2} \times 16 = 8g$$

(iii) N= 6.022x 10^{24} No = 6.022×10^{23} m = 16×2=32g m=?

$$n = \frac{N}{N0} = \frac{\cancel{6.022} \times 10^{24}}{\cancel{6.022} \times 10^{23}} = 10$$

$$m = n \times m$$
$$= 10 \times 32 \qquad = 320g.$$

(a) six postulates of Daltons Atomic Theory – (Ref page 32 Article 3.12 NCERT Text Book.

(b) Mass of compound = 0.24g Mass of born = 0.096g

$$\% \text{ of carbon} = \frac{Mass \text{ of born x100}}{Mass \text{ of compond}} = \frac{0.096x100}{0.24} = 40/$$

$$\% \text{ of oxygen} = \frac{Mass \text{ of oxygen x 100}}{Mass \text{ of compound}} = \frac{0.144x100}{0.24} = 60/$$

22. (a) Energy possessed by a body as a virtue of its motion is kinetic energy.
Derivation of relation KE = ½ mv²
Consider a body of mass m initially at rest. If on application of force f it travels a distance S
Work done = f x s. By Newton's second law work = m × s × S where a = acceleration
Using 3rd equation of motion $v^2 - u^2 = 2as$
$(v^2 - u^2) / 2 = as$
$W = m \times (v^2 - u^2) / 2$
As intial velocity is zero, w = ½ mv²
So, KE = ½ mv²

(b) ml< m2, p1 = p2
E = p2 /2m for give moment E α 1/m
So KE1 / KE2 = m2/m1

$$K.E \alpha \frac{1}{mass \text{ of the object}}$$

OR

Energy can neither be created nor destroyed it can only be trans formed from one form to another.

(a) In the free fall PE is finally converted to KE in between both KE and PE can be proved using numerical values.

(b) In vibration pendulum at extreme point and at mean position only PE and in between both PE & KE.

23.

	Longitudinal wave		Transverse waves
(i)	The particles of the medium Move in a direction parallel to The direct of propagation of The disturbance.	(i)	The particles of the medium move about their mesan position in a direction perpen-cular to the direction of wave Propagation.
(ii)	Compressions and rarefactions are formed	(ii)	crests and troughs are formed
	e.g sound waves		e.g. light waves

Light waves are not mechanical waves

(b) V = 339 m/s χ = 1.5 /100m ∂ =?

$$\partial = \frac{\partial}{\lambda} = \frac{339x1000}{1.5} = 22600Hz$$

As the frequency is more than 20KHz it is not audible to humans.

OR

(b) Frequency ∂ = 120 KHz = 120000 Hz v= 360 m/s

$$\text{Wavelength } \lambda = \frac{u}{v} = \frac{360 \text{ m/s}}{12.000 \text{ /s}} = 0.003 = 3mm$$

The time taken by the wave to travel a distance, d of 1.5 km

$$t = \frac{d}{v} = \frac{1.5X1000}{700} = 2.15$$

These sound will take 2.1 s to travel a distance of 1.5 km.

24. (a) For carbon cycles see NCERT page 199 Fig 14.7

(b) Ozone layer is present in the stratosphere of the atmosphere. This layer prevents harmful radiations like ultraviolet radiation from reaching the surface of the earth where they may damage many forms of life.

OR

(a) For water cycles see NCERT page 197 Fig 14.5

(b) Fats - it gives energy to the body

Carbohydrates – it gives energy to the body.

Solution SUMMATIVE ASSESSMENT – II SCIENCE / Class – IX Code-JS-003

25.	(c)	**32.**	(c)	**39.**	(b)
26.	(b)	**33.**	(c)	**40.**	(c)
27.	(c)	**34.**	(d)	**41.**	(d)
28.	(b)	**35.**	(a)	**42.**	(b)
29.	(d)	**36.**	(b)		
30.	(d)	**37.**	(d)		
31.	(d)	**38.**	(a)		