FINAL EXAMINATION,
MARCH 2007

Std.IX

Max.Marks:60
Time: 2½ hours

SCIENCE (THEORY)

General Instructions :
1. The question paper comprises of two sections, A and B. You are to attempt both the sections.
2. The candidates are advised to attempt all the questions of Section A separately and questions of Section B separately.
3. All questions are compulsory.
4. There is no overall choice. However, internal choice has been provided in some questions. You are to attempt only one option in such questions.
5. Marks allocated to every question are indicated against it.

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SECTION A

1. The atomic number of an element is 9. Write down its electronic configuration and valency. 1

2. State the law of conservation of energy. 1

3. Express the temperature 82 K on Celsius scale. 1

4. Write down the unit of 'g' and 'G'? 1

5. A bullet initially moving with a velocity of 20m/s strikes a target and comes to rest after penetrating a distance of 0.01m in the target. Calculate the retardation produced by the target. 2

6. (a) State the law of conservation of mass.
(b) 0.8 g of phosphene gas on decomposition yielded 0.375 g of phosphorus and 0.325 g of hydrogen. Show that these data is in agreement with the above law. 2

OR

(a) Define atomicity. Write down the atomicities of (i) Sodium (ii) Ozone
(b) A certain metal carbonate has the formula MCO_3. Find the chemical formula of its sulphide. 2

7. Give reasons: 2
(a) The rate of diffusion of liquids is higher than that of solids
(b) Steam produces more severe burns than boiling water.

8. Give the ranges of frequencies of ultrasound and infrasound. Also mention 2 applications of ultrasound. 2

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9. (a) What modifications did Bohr introduce in his atom model?
   (b) What are isotopes? Name two isotopes of carbon. Give 2 medical applications of isotopes.   3

10. (a) Distinguish between mass and weight.
    (b) Calculate the mass of an object whose weight is 49 N.
    (c) A nail made of iron sinks in water but a cork floats on it. Why?   3

11. (a) Derive the expression for potential energy of a body due to its height
    (b) A car weighing 1000 kg decelerates uniformly at $5m/s^2$ and stops at a distance of 50 m. Calculate the work done by the brakes.   3

OR

    (a) Define the S.I. unit of work
    (b) A 1000 W electric geyser is used for 2 hours daily. How many units of electrical energy does it consume in 30 days?.   3

12. (a) How many molecules of water are there in 1 g of water?
    (b) What weight in grams is represented by 5.14 moles of H_5IO_6?   3
    (Given atomic masses of H-1, O-16, I-127)

13. (a) Name the method used to separate colloidal particles. On what principle is it based?
    (b) Compare the properties of solutions and suspensions.   3

14. (a) Why are sound waves called mechanical waves?
    (b) A ship on the surface of water sends a signal and receives it back after 4 seconds from a submarine inside water. How deep is the submarine from the ship?
    (Given speed of sound in water is 1450 m/s.)   3

15. (a) Humus is an important factor in deciding soil structure. Justify?
    (b) Write a note on the importance of water in the lives of plants and animals.   5

OR

    (a) What are the causes of water pollution?
    (b) What is soil erosion? Mention the causes and methods of reducing the same.   5

16. (a) State Newton's I Law of motion
    (b) The V-T graph of a coin moving on a table is given in figure. If the weight of the coin is 10g, how much force does the table exert on coin to bring it to rest?
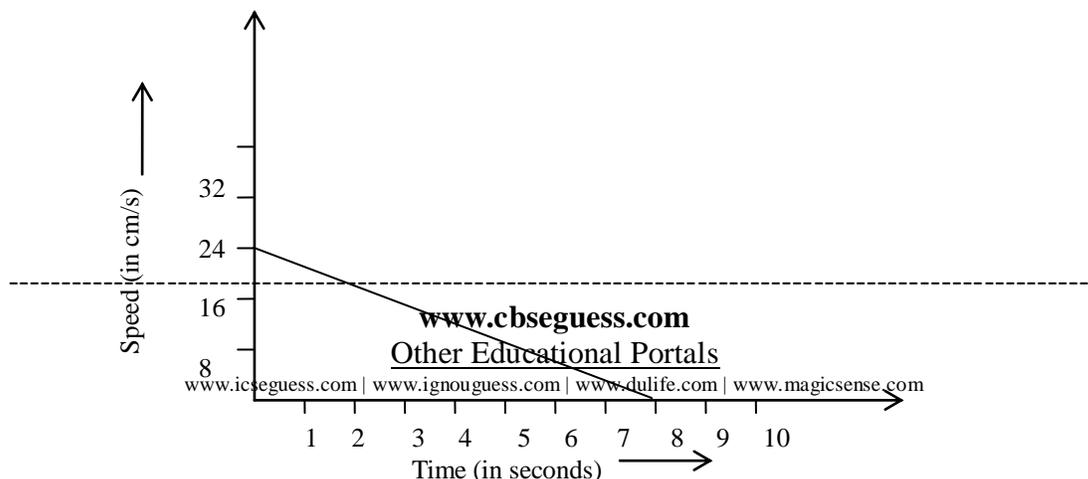
(c) Two marbles of masses 40g and 60g moving in the same direction with velocities 4m/s and 6m/s on a table undergoes elastic collision. With what velocity do they move if they stick together after collision?   5

SECTION B

17. How does the circulatory system of cockroach differ from that of a man?   1

18. name the causative organism of the following diseases   1
     (a) Kala azar
     (b) AIDS

19. Differentiate between   2
     (a)   broilers and layers
     (b)   mariculture and aquaculture

20. What are vectors? Name a vector with the disease it transmits.   2

21. (a) Who proposed the five kingdom classification? What was the basis for such a classification?
     (b) Give two characteristic features of kingdom Monera?   3

22. (a) Compare the chemical composition of the matrix of bone and cartilage.
     (b) State the functions of epidermis in plants

OR

     (a) Name the type of permanent tissue present in coconut husk
     (b) How is this tissue structurally different from parenchyma?
     (c) Distinguish between tendon and ligament.   3

23. (a) What is the principle of organic farming?
     (b) What are the advantages that manures offer over fertilizers?   3

24. (a) Draw a neat labelled diagram of a plant cell.
     (b) Which part of this cell enables it to exist in a hypotonic media without bursting? Explain. 5

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086/1.

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ANSWERS/HINTS
(Marks for each value point written in brackets)

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Q.No.	Value points	Marks allotted

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SECTION A

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1	Electronic configuration – 2, 7 (1/2) Valency = 8-7 = 1 (1/2)	**1**
2	Energy can neither be created nor destroyed, it can only be converted from one form to another.	**1**
3	82 K = $(82-273)^0$C = -155^0C	**1**
4	Unit of g – m/s^2, G – Nm^2kg^{-2}	**1**
5	Applying $v^2 - u^2 = 2as$, we get (1/2) $0^2 - 20^2 = 2a \times 0.01$ (1) $a = -20000 \ m/s^2$ r $= 20000 \ m/s^2$ (1/2)	**2**
6 (a)	Law states that mass can neither be created nor be destroyed in a chemical reaction. (1)	**2**
(b)	Mass of reactants = 0.8 g Mass of products = 0.375 + 0.325 g = 0.8 g Hence, mass of reactants = mass of products. (1)	

<div align="center">**OR**</div>

(a)	Atomicity is the number of atoms constituting a molecule (1/2) Atomicities of (i) Na= 1, (ii) Ozone = 3 (1/2)	
(b)	$MCO_3 \Rightarrow$ Valency of M = 2 (1/2) $\therefore$ Formula of sulphide = MS (1/2)	
7 (a)	Molecule in liquid have more space between them than in solids (1)	**2**
(b)	Steam has energy in form of latent heat (1)	
8	Ultrasound - >20,000 Hz, Infrasound: < 20 Hz (1/2 + 1/2 = 1) Application of ultrasound: any 2 (1) - Cleaning - detecting cracks and flaws in metal blocks - Ultrasound scanning - Echocardiography - SONAR	**2**

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9 (a)   Bohr Atom Model   (2x ½ =1)   **3**
          - Only certain special orbits called discrete orbits of electrons are
            allowed inside the atom.
          - While revolving in discrete orbits electrons do not radiate energy

    (b)   Atoms of elements with same atomic number but different mass numbers (1/2)
          Carbon isotopes $^{12}_{6}C$ and $^{14}_{6}C$ (1/2)

          Isotope of Cobalt – treatment of cancer (1/2)
          Isotope of Iodine – treatment of goitre (1/2)

10 (a)   **3**

Mass	Weight
It is the amount of matter contained in a body	It is the force with which a body is attracted towards the earth
Unit of mass : kg	Unit of weight : N
Remains constant everywhere	Not constant everywhere

                                        Any 2 differences (2*1/2 =1)

    (b)   Weight = mg   (1/2)
          mg = 49 N
          m = 49/9.8 = 50 kg.   (1/2)
    (c)   Density of nail is more than that of water. Hence upthrust is less than its weight.
          hence it sinks   (1/2)
          Density of cork is less than that of water. Hence upthrust is more than its
          weight. hence it floats. (1/2)

11 (a)   Consider an object of mass, *m*. Let it be raised through a height, *h* from the   **3**
          ground. A force is required to do this. The minimum force required to raise the
          object is equal to the weight of the object, *mg*. The object gains energy equal to
          the work done on it. Let the work done on the object against gravity be *W*.
          That is, work done, W = force · displacement = $mg \cdot h = mgh$
          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.
                         $E_p = mgh$ (1½ marks)
    (b)   Force applied by the brakes = ma = 1000 x (-5) = -5000 N
          Work done by brakes = force x displacement = -5000 x 50 = -250000 J
             = -250kJ   (1 ½ marks)
                                        OR
          1 J is defined as the work done on an object when a force of 1 N displaces it by
          1 m along the line of action of the force. (1)
          Electrical energy consumed in 1 day. = P x t = 1000 W x 2 hrs = 1 kW x 2 hr
                                        = 2 kWh = 2 units   (1 ½)
          No. of units consumed in 30 days = 30 x 2 = 60 units.   (1/2)

12 (a)   Mol.mass of water = 2x1+16 = 18 g   (1/2)   **3**
          No. of molecules in 18 g of water = 6.022×10^{23} molecules

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$$\therefore \text{ No. of molecules in 1 g of water} = \frac{6.022 \times 10^{23}}{18} = 3.34 \times 10^{22} \text{ molecules} \quad (1)$$

(b) Mol. mass of H_5IO_6 = 5x1 + 127 + 6x16 = 228 g (1/2)
Weight in g of 1 mol of H_5IO_6 = 228 g
$\therefore$ Weight of 5.14 mol = 228 x 5.14 = 1171.92 g (1)

13 (a) Centrifugation (1/2)   **3**
The principle is that the denser particles are forced to the bottom and the lighter particles stay at the top when spun rapidly. (1)

(b) Differences (any 3- 1½)

Solution	Suspension
Homogenous mixture	Hetergogenous mixture
Cannot be seen by naked eye (nm)	Particles seen by naked eye
Do not scatter light	Particles scatter beam of light
Stable – do not settle down	Unstable – settle down

14 (a) Sound waves are characterised by the motion of particles in the medium and are   **3**
called mechanical waves.   (1)

(b) d = vt/2 = (1450 x 4)/2 = 2900 m = 2.9 km (2)

15 (a) Humus is major factor in deciding the soil structure because it causes the soil to   **5**
become more porous - allows water and air to penetrate deep underground (1)

(b) Importance of water (all points – 4)
   - All cellular processes take place in a water medium.
   - All the reactions that take place within our body and within the cells occur between substances that are dissolved in water.
   - Substances transported from one part of the body to the other in a dissolved form. Hence, organisms need to maintain the level of water within their bodies in order to stay alive.
   - Terrestrial life-forms require fresh water for this because their bodies cannot tolerate or get rid of the high amounts of dissolved salts in saline water.

OR

(a) Water pollution causes (any 4 – 1/2x4=2)
   - fertlilsers and pesticides
   - sewage from towns and cities
   - effluents from factories
   - hot water from factories
   - dams

(b) Soil erosion – washing away of top soil (1)
Causes – rain, wind (1)
Methods of reduction – afforestation (1)

16 (a) A body continues to be in its state of rest or of uniform motion unless an   **5**

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external unbalanced force acts on it (1)

(b) $a = (v-u)/t = (24-0)/8 = 3$ m/s^2
$F = ma = 0.01 \times 3 = 0.03$ N (2)

(c) Applying law of conservation of momentum
$m_1v_1 + m_2v_2 = (m_1+m_2)v$
$40\times4 + 60\times6 = (40+60)\times V$
$V = 5.2$ m/s (2)

SECTION B

17		Cockroach has open circulatory system	**1**
		Man has closed circulatory system	
18	(a)	Leishmania (1/2)	**1**
	(b)	Human Immunodeficiency Virus (1/2)	
19	(a)	Broilers – meat, layers – eggs (1)	**2**
	(b)	Mariculture- fish culture in marine environment, Aquaculture-in inland	
20		Vectors – Animals which carry infecting agent from sick person to normal person. (1)	**2**

Eg- Mosquito(1/2)
Disease - Malaria, Elephantiasis, Japanese Encephalitis (any1) (1/2)

21 (a) R.H.Whittaker (1/2) **3**
cell structure, mode and source of nutrition and body organization ($3\times \frac{1}{2}=1\frac{1}{2}$)

(b) Monera ($2 \times \frac{1}{2} = 1$)
- no well defined nucleus or organelles
- mode of nutrition –autotrophic or heterotrophic
- some have cell wall; others do not

22 (a) Bone-Ca & P (1/2) Cartilage – proteins and sugar (1/2) **3**
(b) Any 4 : (2)
- protection of plant pasrts
- exchange of gases and transpiration
- cutin-desert plants- prevents loss of water
- aerial parts- prevents mech injury and invasion by fungi
- root hair cells – absorption of water & minerals

OR

(a) Sclerenchyma (1/2)
(b) Dead cells, thickened walls (lignin), no intercellular spaces (1 ½)
(c)

Ligament	Tendon	
(i)Connect 2 bones	(i)Connect bones to muscles	(1/2)
(ii)Elastic tissue	(ii)Fibrous tissue	(1/2)

23 (a) Organic farming is a system with **3**

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- minimal of no use of fertilizers, chemicals, pesticides
- maximum input of organic manures
- use of bioagents in preparation of biofertilizers
- healthy cropping systems   (1/2x4= 2)

(b)   Advantages of manures over fertilizers
- prepared from decomposition of plant and animal wastes
- increases soil fertility
- protection of environment
- increases water holding capacity in sandy soils
- decreases water logging in clayey soils

(any 2 points   1/2x2 =1)

24   (a)   Refer NCERT Textbook: Figure (2 1/2)   **5**
     (b)   Cell wall (1/2)
            In hypotonic media cell tends to take up water by osmosis. It swells building up
            pressure against cell wall. Cell wall exerts and equal pressure against the
            swollen cell and prevent it from bursting   (2)

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Total Marks

60

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