Reg.No. ☐☐☐☐☐☐

COMMON FIRST REVISION TEST - 2020
STANDARD - X

Time : 3.00 hrs

Science
Part - I

Marks: 75

Note: i) Answer all questions

12 x 1 =12

1. If $\sqrt{B}, \sqrt{G}, \sqrt{R}$ be the velocity of blue, gree and red light respectively in a glass prism, then which of the following statement gives the correct relation?

     a) $\sqrt{B} = \sqrt{G} = \sqrt{R}$　　b) $\sqrt{B} > \sqrt{G} > \sqrt{R}$　　c) $\sqrt{B} < \sqrt{G} < \sqrt{R}$　　d) $\sqrt{B} < \sqrt{G} > \sqrt{R}$

2. Kilowatt hour is the unit of

     a) resistivity　　　　b) conductivity　　　　c) electrical energy　　　d) electrical power

3. If a sound wave travels with a frequency of 1.25×10^4 Hz at $344 ms^{-1}$, the wavelength will be

     a) 27.52m　　　　b) 275.2m　　　　c) 0.02752m　　　　d) 2.752m

4. Kamini reactor is located at ....

     a) Kalpakkam　　　b) Koodankulam　　　c) Mumbai　　　　d) Rajasthan

5. The gram molecular mass of water molecule (H_2O) is,

     a) 44g　　　　b) 17g　　　　c) 18g　　　　d) 36.5g

6. Chemical formula of rust is ....

     a) $FeO \times H_2O$　　b) $FeO_4 \times H_2O$　　c) $Fe_2O_3 \times H_2O$　　d) FeO

7. the pH of a solution is 3. Its (OH^-) concentration is

     a) 1×10^{-3} m　　b) 3m　　c) 1×10^{-11} m　　d) 11m

8. $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ is a

     a) reduction of ethanol　　b) combustion of ethanal　　c) oxidation of ethanoic acid
     d) Oxidation of ethanal

9. Kreb's cycle takes place in

     a) Chloroplast　　　b) mitochondrial matrix
     c) stomata　　　　d) inner mitochondrial membrane

10. Site for processing of vision, hearing, memory, speech intelligence and thought is

     a) Kidney　　　　b) ear　　　　c) brain　　　　d) lungs

11. The number of chromosomes found in human beings are ....

     a) 22 pairs of autosomes and 1 pair of allosomes
     b) 22 autosomes and 1 allosome　　　c) 46 autosomes
     d) 46 pairs autosomes and 1 pair of allosomes

12. Where you will create category of bloks?

     a) block palette　　b) block menu　　c) script area　　d) sprite

Part - II

Note: Answer any 7 questions. Ques. No. 22 is compulsory.

7x2 = 14

13. State Boyle's law.

14. Match the following:
    a) Co - 60   - Age of fossil
    b) I - 131   - Function of heart
    c) Na - 24   - Leukemia
    d) C - 14   - Thyroid disease
15. Find the percentage of nitrogen in ammonia
16. Give an example each.
    i) Gas in liquid   ii) Solid in liquid iii) Solid in solid iv) Gas in gas
17. Differentiate reversible and irreversible reactions.
18. Why are the rings of cartilages found in trachea of rabbit?
19. What are chemical messengers?
20. What are the various routes by which transmission of HIV takes place?
21. What is the importance of rainwater harvesting?
22. The resistance of a wire of length 10 m is 2 ohm. If the area of cross section of the wire is 2×10^{-7} m^2, determine its i) resistivity ii) conductance.

Part - III

Note: i) Answer any 7 questions. Q. No. 32 is compulsory.   **7 x 4 = 28**

23. Differentiate the eye defects: myopia and hypermetropia.
24. Derive the ideal gas equation.
25. At what temperature will the velocity of sound in air be double the velocity of sound in air at $0^\circ C$?
26. The electronic configuration of metal A is 2, 8, 18, 1. The metal A when exposed to air and moisture forms B a green layered compound. A with con H_2SO_4 forms C and D along with water. D is a gaseous compound. Find A, B, C and D.
27. How does pH play an important role in everyday life?
28. Differentiate the following:
    monocot root and dicot root.
29. The sex of the new born child is a matter of chance and neither of the parents may be considered responsible for it. What would be the possible fusion of gametes to determine the sex of the child?
30. With a neat labelled diagram explain the techniques involved in gene cloning.
31. Suggest measures to overcome the problems of an alcoholic.
32. 16 grams of NaOH is dissolved in 100 grams of water at $25^\circ C$ to form a saturated solution. Find the mass percentage of solute and solvent.

Part - V

Note: Answer all the questions. (Draw diagram whenever necessary)   **3x7 = 21**

33. i) State the universal law of gravitation and derive its mathematical expression.
    ii) Give the applications of universal law gravitation.   **(OR)**
    i) Compare the properties of alpha, beta and gamma radiations.
    ii) Write any three features of natural and artificial radioactivity.
34. i) Give the salient features of "Modern atomic theory".
    ii) Calculate the % of oxygen in $Al_2(SO_4)_3$ (Atomic mass: Al - 12, O - 16, S - 32) **(OR)**
    i) An organic compound 'A' is widely used as a preservative and has the molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound 'B'.
    a) Identify the compound 'A'.
    b) Write the chemical euqation for its reaction with ethanal to form compound 'B'.
    c) Name the process.
    ii) How is ethanoic acid prepared from ethanol? Give the chemical equation.
35. Illustrate the structure and functions of brain.   **(OR)**
    What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

First Revision EXAMINATION
Exam. No.......... 1003 ....
Subject.......... Science ....
Std. Sec...... $\bar{X}$ - A
Date........ 08/01/2020 ....

S. Menny
8/12

①

$\dfrac{69}{75}$

	No. of. Additional Paper = 4
Total no. of. Pages 12

I   Answer all the questions

1. c) $\sqrt{B} < \sqrt{G_1} < \sqrt{R}$

2. c)   electrical energy

3. c)   0.02752 m.

4. a)   kalpakkam

5. c)   189

6. c) $Fe_2O_3 \cdot xH_2O$

7. c) 1×10^{-11} m.

8. b)   combustion of ethanol

9. b)   mitochondrial matrix

10. c)   Brain

11. a)   22 pair of chromosomes & 1 pair of allosomes

12. b)   block menu.

II   Answer any 7 questions

13. Boyle's law :

       Boyle's law states that when the temperature of a

gas is kept constant, the volume of a fixed mass of gas is inversely proportional to its pressure.

$$P \propto \frac{1}{V}$$

match the following

14. a) Leukemia

b) Thyroid disease

c) Function of heart

d) Age of fossil

Examples

16. i) Gas in liquid - soda water [carbon di oxide dissolve in water].

ii) solid in liquid - salt in water

iii) solid in solid - Alloys [copper get dissolved in gold]

iv) Gas in gas - mixture of helium

Differentiate reversible and irreversible reaction.

17.

Reversible reaction	Irreversible reaction
* It can be reversed under suitable condition	* It cannot be reversed.
* It attain equilibrium	* Equilibrium is not attained
* It is relatively slow	* It is fast

18. Trachea of rabbit supported the rings of cartilage which helps in free passage of air.

19. * chemical messengers are known as hormones

* physiological process such as metabolism, digestion, growth

③

development are controlled by the hormones

E.g: Growth hormone

21. __Importance of rainwater harvesting :__

    * It overcomes the depletion of ground water level

    * Reduce flood & soil erosion.

    * water is stored in ground is not contaminated by the human and animal waste and used for drinking purpose

    * To meet a rapid growth water level.

III. Answer any 7 questions

Differentiate myopia and hypermetropia.

23.

Myopia	Hypermeteropia
* It is also known as short sightedness	* It is also known as long sightedness
* It occurs due to the lengthening eye ball	* It occurs due to the shortening of the eye ball.
* Distant object cannot be seen clearly.	* Nearby objects can be seen clearly.
* The focal length of eye lens is increased.	* The focal length of eye lens is decrease.
* The distance between eye lens and retina reduced	* The distance between eye lens and retina increase
* Nearby object has go farther	* Distant object has come closer.

* It can be corrected using concave lens.	* It can be corrected using convex lens.

Ideal gas equation:

24.   * Ideal gas equation relations all the properties of an ideal gas.

    * It obey bogle's law, charles law and Avagardo law.

According to Boyle's law

$$PV = constant \quad \text{———①}$$

According to charles law

$$\frac{V}{n} = constant \quad \text{———②}$$

According to Avagardo law

$$\frac{V}{T} = constant \quad \text{———③}$$

    * On combing the above equation ①,②,③ we get

$$\frac{PV}{nt} = constant \quad \text{———④}$$

    * The above relation is called combined law of gases

    * If we consider the gas the μ times of the mole will consider to be the collection of atoms. Therefore

$$i.e \quad N = \mu N_A. \quad \text{———⑤}$$

    * On combining the equation ④ & ⑤ we get the following equation $\quad \frac{PV}{\mu N_A T} = constant.$

    * The constant in the above equation is taken to be K_B.

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9t is called Boltzmann constant $[1.38 \times 10^{23}]$. Hence we have

$$\frac{PV}{\mu NAT} = K_B$$

[Here, $\mu NAK_B = R$; R is a universal constant $8.31 \, mol \, J$]

$$PV = \mu NAK_B T$$

$$PV = RT$$

26. Given :

The electronic configuration metal A = 2, 8, 8, 1

$$A \longrightarrow B \, [green \, layer]$$

$$A \xrightarrow{Con.H_2SO_4} C + D \, [water]$$
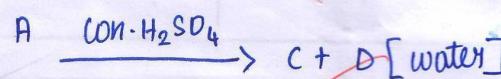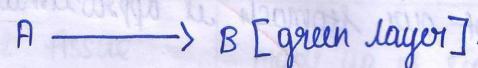
Find A, B, C, D.

Solution :

* metal A = copper

* copper get covered with green layer of basic copper carbonate in the presence of CO_2 and moisture
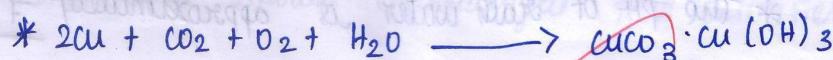
* $2Cu + CO_2 + O_2 + H_2O \longrightarrow CuCO_3 \cdot Cu(OH)_3$

* copper react with $Con.H_2SO_4$ to form sulphur dioxide gas and copper sulphate

$$Cu + 2H_2SO_4 \longrightarrow CuSO_4 + SO_2 \uparrow + 2H_2O$$

A - copper

B - copper carbonate

C - copper sulphide

D - sulphur dioxide

⑥

Importance of PH :

27.
* PH of value play an important role in our daily life
* our Body ph ranges from 7.35 - 7.45.
* If any increase or decrease in this range lead to disease
* The ideal PH of human blood is 7.4.

PH of stomach :

* our stomach produce hydrochloric acid which helps in digestion of food without harming any cells.
* The PH value of our stomach is approximately 2.0.

PH of soil :

* In agriculture The PH of soil is very important
* Sugarcane require Black soil
* Fruit requires slightly alkaline soil.
* while rice requires neutral soil.

PH of rain :

* The PH of rain water is approximately 7.10, It is neutral.
* If any increase or decrease in this range cause acid rain
* The air mixtures in atmosphere of the gases such as nitrogen and sulphur cause acid rain.
* If it flow along the river the PH of river is decreased.

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28. Differentiate monocot root and dicot root

Name	monocot root	dicot root
number of xylem	polyarch	Tetrach
Cambium	Absent	present [during secondary growth]
secondary growth	Absent	present
pith	present	Absent
conjective tissue	made up of sclerenchyma	made up of parenchyma

31. Education and counselling:

* Education and proper counselling help the alcoholics to overcome their problem and stress and to lead a happy life.

Physical activity:

* Individual should channalized their activities into healthy habits such as walking, yoga, music, meditation etc.

Seek help from peer & parents:

* When problematic situation occurs, individual should seek help and guidance from peer and parents.

* It would help them to share their feelings of anxiety, wrong doing etc.

Medical assistance:

    * Individuals should seek help from the physiologist and physurtiotic to leave from problem and to lead a relax and happy life.

Mass percentage:

32.   Mass of the solute = 16 g

        Mass of the solvent = 100 g

i) mass percentage of the solute = $\dfrac{\text{mass of the solute}}{\text{mass of solute + mass of solvent}} \times 100$

$$= \dfrac{16 \times 100}{16 + 100}$$

$$= \dfrac{1600}{116}$$

$$= 13.79 \%$$

ii) mass percentage of solvent = 100 − (mass percentage of the solute)

$$= 100 - 13.79$$

$$= 86.21 \%$$

IV) Answer all the questions

33. i) universal law of gravitation:

    = The universal law of gravitation states that the every particles in the universe attracts with each other. The mass of the object is directly proportional to the product of their two masses and inversely proportional to distance

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between the bodies."

Proof:
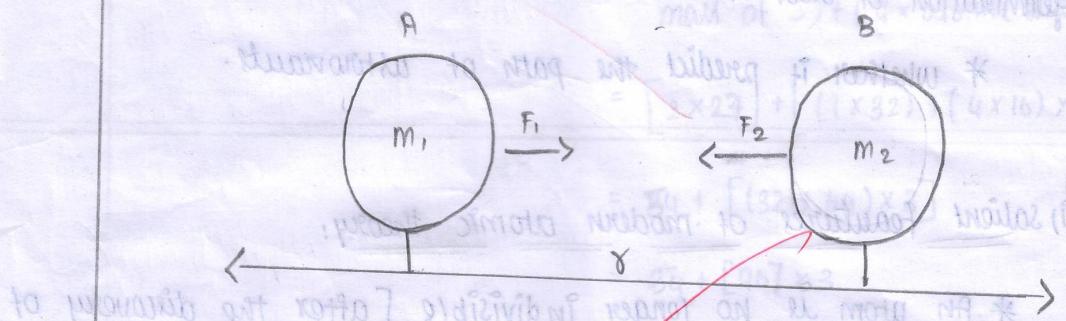
* Let m_1 & m_2 be the masses of two bodies A and B with r as the distance.

$$G \propto m_1 \times m_2 \quad \text{———} \text{①}$$

$$G \propto \frac{1}{r^2} \quad \text{②}$$

* On combining the above two equations have, we have

$$G \propto \frac{m_1 \times m_2}{r^2}$$

$$= \frac{G m_1 m_2}{r^2}$$

* Here, G is a universal and gravitational constant.

ii) Application of universal law of gravitation

* Dimensions of heavenly bodies is calculated by the gravitational law. mass of the earth, radius of the earth, acceleration due to gravity has highly measurement.

 * It helps to produce stars and planets.

 * It helps to study in geotropism instead of study germination of root.

 * whether it predict the path of astronauts.

34. i) Salient features of modern atomic theory:

 * An atom is no longer indivisible [after the discovery of electron, proton and neutron].

 * The atom is a smallest particle that take place in chemical reaction.

 * The atom can be converted into energy [$E = mc^2$]

 * An atom is a smalleset particle

 * Atom of a same element may have different atomic masses [discovery of isotope $_{17}Cl^{35}$ $_{17}Cl^{37}$].

 * An atom of an different element may have same atomic masses [discovery of isobar $_{18}Ar^{20}$ $_{19}Al^{20}$].

 * One atom of an element can be transmutated into atom of an another element [discovery of artificial transmutation]

  E.g: i) Glucose = $C_6H_{12}O_6$ = C:H:O = 6:12:6 = 1:2:1

   ii) sucrose = $C_{12}H_{22}O_{11}$ = C:H:O = 12:22:11.

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iii) $Al_2(SO_4)_3$

molar mass of $Al_2(SO_4)_3 = [2 \times$ atomic mass of Al$] + [(1 \times$ atomic

mass of S$) + (4 \times$ atomic mass of O$)3]$

$$= [2 \times 27] + [(1 \times 32) + (4 \times 16) \times 3]$$

$$= 54 + [(32 + 64) \times 3]$$

$$= 54 + [96] \times 3$$

$$= 54 + 288$$

$$= 342 \ g$$

% of oxygen $= \dfrac{\text{mass of oxygen}}{\text{molar mass of } Al_2[SO_4]_3} \times 100$

$$= 12 \text{ oxygen atoms} \times \frac{16}{342} \times 100$$

$$= 12 \times [0.0467 \times 100]$$

$$= 12 \times 4.67 = 56.04 \ \%$$

35. i) Structure and functions of brain :

* Brain is covered by three connective tissue membrance or
meninges.

STRUCTURE	FUNCTIONS
1. Cerebral cortex	* Sensory preception
	* Controls involuntry functions
	* Thinking
	* memory
	* decision making
	* creativity.

⑫

2. Thalamus	* Act as relay centre
3. Hypothalamus	* It controls the involuntary functions like thirst, hunger etc, * Act as a thermo regulatory centre * important link between nervous system and endocrine system.
4. cerebellum	* Maintenance of posture and balance coordinates voluntary muscle activity.
5. Pons	* sleep awake cycle * Respiration.
6. Medulla oblongata	* cardio vascular * Respiratory * digestive control centers.
7. Corpora quadrigemina	* controls visual * Auditory reflexes.