XTH FIRST REVISION EXAM

SCIENCE

ANSWER KEY - 2025 DINDIGUL DISTRICT

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PART -A

I. CHOOSE THE CORRECT ANSWER. (12 x 1 =12)

1. Impulse is equals to

a) rate of change of momentum b) rate of force and time

c) change of momentum d) rate of change of mass

2. The value of universal gas constant

a) 3.81 $Jmol^{-1} K^{-1}$ b) 8.03 $Jmol^{-1} K^{-1}$ c) 1.38 $Jmol^{-1} K^{-1}$ **d) 8.31 $Jmol^{-1} K^{-1}$**

3. The frequency, which is audible to the human ear is

a) 50 kHz **b) 20 kHz** c) 15000 kHz d) 10000 kHz

4. _____ isotope is used for the treatment of cancer.

a. Radio Iodine **b. Radio Cobalt** c. Radio Carbon d. Radio Nickel

5. The gram molecular mass of oxygen molecule is

a. 16 g b. 18 g **c. 32 g** d. 17 g

6. Chemical formula of rust is:

(a) $Fe0.xH_2O$ (b) $Fe0_4.xH_2O$ **(c) $Fe_2O_3.xH_2O$** (d) FeO

7. Identify the non aqueous solution.

a. sodium chloride in water b. glucose in water

c. copper sulphate in water **d. sulphur in carbon-di-sulphide**

8. 'Heart of heart' is called

a) SA node b) AV node c) Purkinje fibres d) Bundle of His

9. The normal pH of human blood is _____

a) 7.4 b) 7 c) 7.2 d) 7.1

10. Okasaki fragments are joined together by _____.

a) Helicase b) DNA polymerase c) RNA primer **d) DNA ligase**

11. World 'No Tobacco Day' is observed on

a) May 31 b) June 6 c) April 22 d) October 2

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12. Which is used to edit programs?

a) Inkscape **b) script editor** c) stage d) sprite

PART-II

II. ANSWER ANY 7 QUESTIONS (Q.NO:22 IS COMPULSORY).

13. What is refractive index?

It is defined as ratio of the speed of light in air (or) vacuum to the speed of light in medium. $\mu = c / v$

14. State Ohm's law.

At a constant temperature, the steady current 'I' flowing through a conductor is directly proportional to the potential difference 'V' between two ends of the conductor.

$$V = IR$$

15. Write the different types of isotopes of oxygen and its percentage abundance.

Isotope	Mass (amu)	% abundance
$_8O^{16}$	15.9949	99.757
$_8O^{17}$	16.9991	0.038
$_8O^{18}$	17.9992	0.205

16. Differentiate reversible and irreversible reactions.

Reversible Reaction	Irreversible reaction
i) It can be reversed under suitable conditions	It cannot be reversed
ii) Both forward and backward reactions take place simultaneously	It proceeds only in forward direction
iii) It attains equilibrium	Equilibrium is not attained
iv) It is relatively slow	It is fast

17. Write a short note on mesophyll.

- **In a leaf, the tissue present between the upper and lower epidermis is called mesophyll.**

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- It is differentiated into palisade parenchyma and Spongy parenchyma.

18. What are the structures involved in the protection of brain?

(i) Duramater (ii) Arachnoid (iii) Piamater

19. What are allosomes?

- ❖ Sex chromosomes.
- ❖ Responsible for sex determination.
- ❖ A male has XY chromosome.
- ❖ A female has XX chromosome.

20. What is co-efficient of cubical expansion?

The ratio of increase in volume of the body per degree rise in temperature to its unit volume is called as co-efficient of cubical expansion. It's unit is K-1.

21. What is Scratch?

- ❖ 'Scratch' is a software used to create animations, cartoons and games easily.
- ❖ It is a visual programming language.

22. Calculate the amount of energy released when a radioactive substance undergoes fusion and results in a mass defect of 2 kg.

Ans:

Mass defect in the reaction (m) = 2 kg

Velocity of light (c)=3×10^{8}m s^{-1}

By Einstein's equation, Energy released $E=mc^{2}$

So $E=2\times(3\times10^{8})^{2}$

$=1.8\times10^{17}$J

PART-III

III. ANSWER ANY 7 QUESTIONS (Q.NO:32 IS COMPULSORY).

23. a) State Joule's law of heating.

Joules' law of heating states that the heat produced in any resistor is Directly proportional to

- ♣ the square of the current passing through the resistor.
- ♣ the resistance of the resistor.
- ♣ the time for which the current passing through the resistor.

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♣ $H = I^2Rt$

b) An alloy of nickel and chromium is used as the heating element. Why?

- It has high resistivity.
- It has a high melting point.
- It is not easily oxidized

24. List any five properties of light.

- Light is a form of energy.
- Light always travels along a straight line.
- Light does not need medium for its propagation.
- The speed of light in air is C = 3 × 108ms^{-1}
- Light is in the form of waves.
- Violet light has the lowest wavelength, and red light has the highest wavelength.

25. a)Write any two features of natural and artificial radioacitivity.

Natural radioactivity	Artificial radioactivity
It cannot be controlled	It can be controlled
Spontaneous process	Induced process
Alpha, beta and gamma are emitted	Elementary particles-neutron, Positron are emitted
Z > 83	Z < 83

b) Give any two uses of radio isotopes in the field of agriculture?

- Radio isotope of P32 – Increase the productivity of crops.
- Radio isotopes can be used to kill the insects and parasites.

26. How does pH play an important role in everyday life?

- Our body works within the pH range of 7.0 to 7.8. If any increases (or) decreases leads to diseases.
- pH of the saliva normally ranges between 6.5 to 7.5. When the pH of the mouth saliva falls below 5.5, the enamel get weathered.
- Toothpastes are generally basic it can neutralize the excess acid and prevent tooth decay.

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- Citrus fruits require slightly alkaline soil, while rice require acidic soil and sugarcane requires neutral soil.
- The pH of rain water is approximately 7. Its pH less than 7. It is called acid rain.

27. a) What is Respiratory Quotient (R.Q)?

- It is the ratio of volume of carbon dioxide liberates and the volume of oxygen consumed during respiration.

$$RQ = \frac{\text{Volume of } CO_2 \text{ liberated}}{\text{Volume of } O_2 \text{ consumed}}$$

b) What is bolting? How can it be induced artificially?

- Bolting : Treatment of rosette plants with gibberellin induces sudden shoot elongation followed by flowering. This is called bolting.
- It is induced by artificial treatment with plant hormone gibberellin.
- It causes stem elongation in plants under normal condition.

28. Define Ethnobotany and write its importance.

- Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of the local culture of people.

Importance of Ethnobotany:

- It provides traditional uses of plant.
- It gives information about certain unknown and known useful plants.
- The ethnomedicinal data will serve as a useful source of information for the chemists, pharmacologists and practitioners of herbal medicine.
- Tribal communities utilize ethnomedicinal plant parts like bark, stem, roots, leaves, flower bud, flowers, fruits, seeds, oils, resins, dyes, gum for the treatment of diseases like diarrhoea, fever, headache, diabetes, jaundice, snakebites, leprosy, etc.

29. a) Write the characteristics of insect pollinated flowers.

- To attract insects these flowers are brightly coloured, have smell and nectar.
- The pollen grains are larger in size, the exine is pitted, spiny etc., so they can be adhered firmly on the sticky stigma

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b) What do you understand by the term phenotype and genotype?

- **Phenotype : External expression of a particular trait.**
- **Genotype : Genetic expression of an organism.**

30. What Precautions can be taken for preventing heart diseases?

- **Diet Management:**
  - **Reduction in the intake of calories, low saturated fat and cholesterol rich food, low**
  - **carbohydrates and common salt are some of the dietary modifications.**
  - **Diet rich in polyunsaturated fatty acids (PUFA) is essential.**
- **Physical activity:**
  - **Regular exercise, walking and yoga are essential for body weight maintenance.**
- **Addictive substance avoidance:**
  - **Alcohol consumption and smoking are to be avoided**

31. What is called homologous series? Give any three of its characteristics?

- **A group of organic compounds having same general formula and similar chemical are called homologous series.**
- **Important characteristics of homologous series:**
- **i) Each series differs from CH_2 group**
- **ii) All members of homologous series contain the same elements and function group.**
- **iii) Chemical properties of the members of a homologous series are similar**
- **iv) All the members can be prepared by a common method.**

32. Calculate % of S in H_2SO_4.

molecular mass of H_2SO_4 = (1 × 2) + (32 × 1) + (16 × 4)

= 2 + 32 + 64 = 98 g

$$\% \text{ of S in } H_2SO_4 = \frac{Mass\ of\ sulphur}{Molecular\ mass\ of\ H2SO4} \times 100$$

$$\% \text{ of S in } H_2SO_4 = \frac{32}{98} \times 100$$

= 32.65%

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PART-IV

IV. ANSWER IN DETAIL:

33. A) a) State Newton's laws of motion.

a) Newton's First law:

Everybody continues to be in its state of rest or the state of uniform motion along a straight line unless it is acted upon by some external force.

b) Newton's second law:

The force acting on a body is directly proportional to the rate of change of linear momentum of the body F = ma

c) Newton's third law: For every action, there is an equal and opposite reaction.

b) The value of Avogadro number is _____ Ans: 6.023×10^{23}.

[OR]

33.B) i) What do you understand by the term 'ultrasonic vibration'?

These are sound waves with a frequency greater than 20 kHz.

ii) State three uses of ultrasonic vibrations.

- ❖ Used in SONAR to measure the depth of sea.
- ❖ Used for scanning the position of stones in the kidney.
- ❖ To make an image of a person's internal body structure.

iii) Name three animals, which can hear ultrasonic vibrations.

1. Mosquito, 2. Dogs, 3. Bats

34. A) i) Explain the mechanism of cleansing action of soap.

- ❖ Polar end is attracted to water.
- ❖ Non-polar end is attracted to dirt on the cloth.
- ❖ The non polar end of the soap molecule traps the dirt
- ❖ The polar end make the entire molecule soluble in water.
- ❖ When a soap is dissolved in water, the molecules join together as clusters called micelles.
- ❖ The polar end of the soap molecules makes the micelles soluble in water.
- ❖ Thus the dirt is washed away with the soap.

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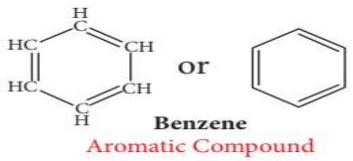
ii) Write their structural formula: a) Propane b) Benzene

CH_3-CH_2-CH_3
Propane



Benzene
Aromatic Compound

[OR]

34. B) i) What is a chemical equilibrium? What are its characteristics?

Chemical equilibrium: Rate of forward reaction = Rate of backward reaction.

$CaCO_3$ (s) ⇌ CaO(s) + CO_2(g)

Characteristics of equilibrium:

- **In a chemical equilibrium the rates of the forward and backward reactions are equal.**
- **Pressure, concentration, colour, density, viscosity etc., of the system remain unchanged with time.**
- **Both the forward and backward reactions continue to occur even though it appears static externally.**
- **In physical equilibrium, the volume of all the phases remains constant**

ii) Define combination reaction. Give one example for an exothermic combination reaction.

- **A combination reaction is a reaction in which two or more reactants combine to form a compound.**
- **Ex: On burning magnesium in air, it combines with oxygen to form magnesium oxide. $2Mg(s) + O_2(g) \rightarrow 2\ MgO(s)$**

35. A) Why are leucocytes classified as granulocytes and agranulocytes? Name each cell and mention its functions.

Granulocyctes :

1. Neutrophils : increased during infection and inflammation

2. Eosinophils : detoxification of toxins.

3. Basophils : They release chemicals during the process of inflammation.

Agranulocytes:

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1. Lymphocytes : They produce antibodies during bacterial and viral infections

2. Monocytes : They are phagocytic and can energy bacteria

[OR]

35. B) i) What are the agents of soil erosion?

- High velocity of wind
- Air currents
- Flowing water
- Landslide
- Human activities (deforestation, farming and mining) and
- Overgrazing by cattle.

ii) Name the types of stem cells.

- Somatic stem cell.
- Embryonic stem cell.

iii) Which organism is considered to be the fossil bird?

- Archaeopteryx is considered to be the fossil bird.

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