



STD : X

DATE : 08.11.2019

SCIENCE - 1

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MARKS : 100

TIME : 02.30 Hrs

PHYSICS (MARKS: 50)

I. Choose the correct answer

6x1=6

- If a substance is heated or cooled, the change in mass of that substance is _____.
a) Positive b) negative c) Zero d) none of these
- Temperature is the average ____ of the molecules of a substance.
a) difference in K.E and P.E b) sum of P.E and K.E
c) difference in T.E and P.E d) difference in K.E and P.E
- In which of the following, no change in mass number of the daughter nuclei takes place ____.
i) α decay ii) β decay iii) γ decay iv) neutron decay
a) i is correct b) ii and iii are correct c) i and iv are correct d) ii and iv are correct
- _____ aprons are used to protect us from gamma radiations.
a) Lead oxide b) Iron c) Lead d) Aluminium
- Which is used to build scripts? a) Script area b) Block palette c) Stage d) Sprite
- Which is used to edit programs? a) Inkscape b) Script editor c) Stage d) Sprite

II. Answer any 7 of the following (Q. No: 11 is compulsory)

7x2=14

- What is scratch?
- Define critical mass.
- Write a short note on editor and its types?
- Match the following:
a) Co - 60 - Age of fossil c) Na - 24 - Leukemia
b) I - 131 - Function of heart d) C - 14 - Thyroid disease
- A cobalt specimen emits induced radiation of 75.6 millicurie per second. Convert this disintegration into Becquerel. (one curie = 3.7×10^{10} Bq)
- a) If A is a radioactive element which emits an α - particle and produces ${}_{104}\text{Rf}^{259}$. Write the atomic number and mass number of the element A.
- Fill in the blanks:
a) The value of Avogadro number -----
b) One calorie is the amount of heat energy required to rise the temperature of ----- of water through -----.
- Calculate the coefficient of cubical expansion of a Zinc bar. Whose volume is increased 0.25 m^3 from 0.3 m^3 due to the change in its temperature of 50 K.
- What is co-efficient of apparent expansion? 16. State Boyle's law.

III. Answer any Four of the following (Q. No: 17 is Compulsory)

4x4=16

- Find the final temperature of a copper rod. Whose area of cross section changes from 10 m^2 to 11 m^2 due to heating. The copper rod is initially kept at 90K. (Coefficient of superficial expansion is 0.0021/ K)
- a) Distinguish between linear, areal (or) superficial expansion.
b) Distinguish between ideal gas and real gas.
- Explain linear expansion with equation.
- a) ${}_{88}\text{Ra}^{226}$ experiences three α - decay. Find the number of neutrons in the daughter element.
b) Fill in the blanks.
i) The average energy released in each fusion reaction is about -----.
ii) If the radiation exposure is 100 R it may cause -----.
- a) Write the features of natural and artificial radioactivity. b) define one roentgen.
- a) State Soddy and Fajan's displacement law.
b) Give any two uses of radio isotopes in the field of agriculture.

IV. Answer the following:

2x7=14

- a) Compare the properties of alpha, beta and gamma radiations. (OR)
b) What is a nuclear reaction? Explain its essential parts with their functions.
- a) Derive the ideal gas equation. (OR) b) Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.

I. Choose the correct answer:**12x1=12**

- The chemical equation $\text{Na}_2\text{SO}_{4(aq)} + \text{BaCl}_{2(aq)} \longrightarrow \text{BaSO}_{4(s)} \downarrow + 2\text{NaCl}_{(aq)}$ represents which of the following types of reaction.
 - Neutralisation
 - Combustion
 - Precipitation
 - Single displacement
- Powdered CaCO_3 reacts more rapidly than flaky CaCO_3 because of ----- .
 - large surface area
 - high pressure
 - high concentration
 - high temperature
- Which of the following represents a precipitation reaction?
 - $\text{A}_{(s)} + \text{B}_{(s)} \longrightarrow \text{C}_{(s)} + \text{D}_{(s)}$
 - $\text{A}_{(s)} + \text{B}_{(aq)} \longrightarrow \text{C}_{(aq)} + \text{D}_{(s)}$
 - $\text{A}_{(aq)} + \text{B}_{(aq)} \longrightarrow \text{C}_{(s)} + \text{D}_{(aq)}$
 - $\text{A}_{(aq)} + \text{B}_{(s)} \longrightarrow \text{C}_{(aq)} + \text{D}_{(l)}$
- A single displacement reaction is represented by $\text{X}_{(s)} + 2\text{HCl}_{(aq)} \longrightarrow \text{XCl}_{2(aq)} + \text{H}_{2(g)}$. Which of the following (s) could be X.
 - Zn
 - Ag
 - Cu
 - Mg
 Choose the best pair.
 - (i) and (ii)
 - (ii) and (iii)
 - (iii) and (iv)
 - (i) and (iv)
- The equilibrium attained during the melting of ice is known as ----- .
 - Physical equilibrium
 - Neutralisation
 - Single Displacement
 - Combustion
- Oxidation of iron causes.
 - Combustion
 - Hydration
 - Rusting
 - Ions formation
- Acid + Base \longrightarrow Salt + Water is the expression for a ----- reaction.
 - Reversible
 - Irreversible
 - Combustion
 - Neutralization
- Ethanoic acid turns ----- litmus to ----- .
 - blue, red
 - red, blue
 - yellow, red
 - blue, yellow
- Bio degradable detergents are made of ----- chain hydrocarbons.
 - branched
 - straight
 - solids
 - liquids
- Hydrocarbons containing carbon to carbon triple bonds are called ----- .
 - alkanes
 - alkenes
 - alkynes
 - alkyls.
- The alkaline hydrolysis of fatty acids is termed as ----- .
 - Saponification
 - Reduction
 - Oxidation
 - Ketone
- 100% pure ethanol is called ----- .
 - Acid
 - Absolute alcohol
 - Aldehyde
 - Ether

II. Answer any six:**6x2=12**

- Fill up:
 - The ion formed by dissolution of H^+ in water is called ----- .
 - A reaction between an acid and base is called ----- .
- True (or) False (Identify the wrong statement)
 - On dipping a P^{H} paper in a solution, it turns into yellow. Then the solution is basic.
 - Silver metal can displace hydrogen gas from nitric acid.
- Define combination reaction. Give one example for an exothermic combination reaction.
- When an aqueous solution of KCl is added to an aqueous solution of AgNO_3 , a white precipitate is formed. Give the chemical equation of this reaction.
- Lemon juice has a $\text{P}^{\text{H}} = 2$, what is the concentration of H^+ ions?
- How do detergents causes water pollution? Suggest remedial measures to prevent this pollution?
- Differentiate soaps and detergents.
- Write the uses of ethanoic acid?

21. Match the following?**Reaction****Type**

- | | | |
|---|---|-----------------------|
| a) $\text{NH}_4\text{OH}_{(aq)} + \text{CH}_3\text{COOH}_{(aq)} \longrightarrow \text{CH}_3\text{COONH}_{4(aq)} + \text{H}_2\text{O}_{(l)}$ | - | Single Displacement |
| b) $\text{Zn}_{(s)} + \text{CuSO}_{4(aq)} \longrightarrow \text{ZnSO}_{4(aq)} + \text{Cu}_{(s)}$ | - | Combustion |
| c) $\text{Zn}(\text{CO}_3)_{(s)} \xrightarrow{\text{heat}} \text{ZnO}_{(s)} + \text{CO}_2_{(g)}$ | - | Neutralisation |
| d) $\text{C}_2\text{H}_4_{(g)} + 4\text{O}_2_{(g)} \longrightarrow 2\text{CO}_2_{(g)} + 2\text{H}_2\text{O}_{(g)} + \text{Heat}$ | - | Thermal Decomposition |

III. Answer any Three:**3x4=12**

- What are called thermolysis reaction?
- A solid compound 'A' decomposes on heating into 'B' and a gas 'C' on passing the gas C through water, it becomes acidic. Identify A, B and C.
- The hydroxide ion concentration of a solution is $1 \times 10^{-11} \text{ M}$. What is the P^{H} of the solution?
- What is a chemical equilibrium? What are its characteristics?
- Define the Biodegradable and Non-Biodegradable detergents.

IV. Answer any Two:**2x7=14**

- Explain the factors influencing the rate of reactions.
- a) Explain the mechanism of cleaning action of soap. b) Write the Decarboxylation Reaction?
- a) How does P^{H} play an important role in everyday life?