SRI VIDYA MANDIR MATRIC HR. SEC. SCHOOL, PALACODE - 636 808

I - 33% EXAMINATION-2019-20

SCIENCE - 1

B

STD : X **MARKS : 100**

DATE : 05.11.2019 FN **TIME : 02.30 Hrs**

PHYSICS (MARKS: 50)

PART - I

I. Choose the correct answer: **6x1=6**

1. The Avogadro's number (N_A) is --------
   a) 6.023×10^{23} / mol b) 6.023×10^{23} J / mol
   c) 6.023×10^{23} J mol^{-1} d) $6.023 \times 10^{-23} J^{-1} mol^{-1}$
2. If a substance is heated or cooled, the linear expansion occurs along the axis of ---------.
   a) x or – x b) y or – y c) both (a) and (b) d) (a) or (b)
3. Proton-proton chain reaction is an example of ----------
   a) Nuclear fission b) α – decay c) Nuclear fusion d) β – decay
4. The average energy released in each fission process is about --------.
   a) 3.2×10^{-10} J b) 3.2×10^{-11} J c) 3.2×10^{-10} Jk^{-1} d) 3.2×10^{-11} Jk^{-1}
5. Assertion : In a β-decay the neutron number decreases by one.
   Reason : In β-decay atomic number increases by one.
   a. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.
   b. If both the assertion and the reason are true, the reason is not the correct explanation of the assertion.
   c. Assertion is true, but the reason is false.
   d. Assertion is false, but the reason is true.
6. Which is used to build script?
   a) Scripts area b) Block palette c) stage d) Sprite

PART – II

II. Answer any seven questions (Q. No. 16 is compulsory) **7x2=14**

7. What is stage?
8. State Boyle's law.
9. Define kilocalorie.
10. Define – Curie.
11. Give any two uses of radio topes in the field of agriculture?
12. Match it:
    a) Co-60 - Age of fossil
    b) I – 131 - Function of Heart
    c) Na – 24 - Leukemia
    d) C – 14 - Thyroid disease
13. Differentiate nuclear fission and nuclear fusion.
14. Calculate the amount of energy released when a radioactive substance undergoes fusion and results in a mass defect of 2 Kg.
15. Distinguish between ideal gas and real gas
16. Keeping the temperature as constant, a gas is compressed four times of its initial pressure. The volume of gas in the container changing from 20 cc (V_1cc) to V_2 cc. Find the final volume V_2.

PART – III

III. Answer any four questions (Q. No. 20 is compulsory) **4x4=16**

17. Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.

18. State Soddy and Fajan's displacement law.
19. 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 90 K. (coefficient of superficial expansion is 0.0021 / k)
20. Identify A, B, C and D from the following nuclear reactions. i) $_{13}Al^{27} + A \longrightarrow {}_{15}P^{30} + B$
    ii) $_{12}Mg^{24} + B \longrightarrow {}_{11}Na^{24} + C$ iii) $_{92}U^{238} + B \longrightarrow {}_{93}Np^{239} + D$
21. a) 'X - rays should not be taken often.' Give the reason.
    b) In japan, some of the new born children are having congenital disease. Why?
22. Write a short note on editor and its types?

PART – IV

IV. Answer all the questions. **2x7=14**

23. a) (i) Compare the properties of alpha, beta and gamma radiations.
    (ii) What are precautions to be taken by people working in radiation labs?

    (OR)

    b) What is a nuclear reactor? Explain its essential parts with their functions.
24. a) (i) Derive the ideal gas equation.
    (ii) 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. **(OR)**

    b) (i) What are the uses of nuclear reactor?
    (ii) What is the principle used in atom bomb.
    (iii) How many power plants in India? Name the nuclear reactor in India.
    (iv) Give the value of kinetic energy of alpha ray.

CHEMISTRY (MARKS: 50)

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

1. Photolysis is a decomposition reaction caused by _____.
   a) Heat b) electricity c) light d) mechanical energy
2. Which of the following statements are correct about a chemical equilibrium?
   i) It is dynamic in nature
   ii) The rate of the forward and backward reactions are equal at equilibrium.
   iii) Irreversible reactions do not attain chemical equilibrium
   iv) The concentration of reactants and products may be different.
   a) i, ii, and iii b) i,ii, and iv c) ii,iii and iv d) i,iii, iv
3. The chemical equation: $Na_2SO_{4(aq)} + BaCl_{2(aq)} \longrightarrow BaSO_{4(s)}\downarrow + 2NaCl_{(aq)}$ represent which of the following type of reaction?
   a) Neutralization b) Combustion c) Precipitation d) Single displacement
4. The P^H of a solution is 3. Its $[OH^-]$ concentration is _____.
   a) $1x10^{-3}$ M b) 3 M c) 1×10^{-11} M d) 11 M
5. $H_{2(g)}+Cl_{2(g)} \longrightarrow 2HCl_{(g)}$ is a _____.
   a) Decomposition reaction b) Combination reaction
   c) Single displacement reaction d) Double displacement reaction
6. Thermal decomposition is otherwise called as _____.
   a) Thermo statics b) Thermodynamics c) Thermolysis d) Thermal energy
7. The soap molecule has a
   a) Hydrophilic head and a hydrophobic tail b) hydrophobic head and a hydrophilic tail
   c) Hydrophobic head and a hydrophobic tail d) hydrophilic head and a hydrophilic tail
8. TFM in soaps represents ___ content in soap.
   a) Mineral b) Vitamin c) Fatty acid d) Carbohydrate

9. Which of the following are used as anaesthetics?
   a) Carboxylic acids b) Ethers c) Esters d) Aldehydes
10. Which of the following statements is wrong about detergents?
   a) It is a sodium salt of long chain fatty acids
   b) It is sodium salts of sulphonic acids
   c) The ionic part in a detergent is – SO_3^- Na^+
   d) It is effective even in hard water
11. Biodegradable detergents are made of ---------- chain hydrocarbons.
   a) Branched b) straight c) Cyclic d) None
12. When marble chips are added in dil.HCl in test tube A, Test tube B filled with powdered calcium carbonate and dil.HCl. The reaction takes place faster in test tube B. Identify the reason for the faster reaction.
   a) Less surface area b) More surface area c) Smaller size of particle d) Both B and C

II. Answer any six: (Q.No.17 is Compulsory) **6 x 2 = 12**

13. **Fill up:-** a) when lithium metal is placed in HCl, ___ gas is evolved.
   b) Chemical volcano is an example for ____ type of reaction.
14. True (or) False
   a) At the equilibrium of a reversible reaction the concentration of the reactants and the products will be equal.
   b) On dipping a P^H paper in a solution, it turns in to yellow. Then the solution is basic.
15. Why does the rate of a reaction increase on raising the Temperature?
16. Differentiate reversible and irreversible reactions?
17. What is the P^H of $1.0x10^{-5}$ solution of KOH?
18. Define ionic product water?
19. Assertion and Reason
   Assertion: Detergents are more effective cleansing agents than soaps in hard water.
   Reason: calcium and magnesium salts of detergents are water soluble.
   a) A and R are correct, R explains the A b) A is correct, R is wrong
   c) A is wrong, R is correct d) A and R are correct, R doesn't explains A
20. How is ethanoic acid prepared from ethanol? Give the chemical equation.
21. Why ordinary soap is not suitable for using with hardwater?

III. Answer any three: **3 x 4 = 12**

22. Explain the types of double displacement reactions with examples?
23. What is a chemical equilibrium? What are its characteristics?
24. 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.
25. Give the balanced chemical equation of the following reactions.
   a) Neutralization NaOH with ethanoic acid
   b) Action of ethanoic acid with $NaHCO_3$
26. Differentiate soaps and detergents?

IV. Answer any Two: **2 x 7 = 14**

27. Explain the factors influencing the rate of reaction?
28. a) Explain the mechanism of cleaning action of soap
   b) Write the Decarboxylation Reaction?
29. a) How does P^H play an important role in everyday life?
   b) Write a short note on Esterification?