GLOBAL SCHOOL OF SCIENCE

First Weekly Exam – [Bhadra 01, 2082]

PHYSICAL GROUP

Class: XI **Full Marks: 70**
Time: 80 min + 80 min

Attempt all the questions.

Physics

Group A

Multiple Choice Questions **[4 × 1 = 4]**
Rewrite the best option in your answer sheet.

1. Two quantities A and B have different dimensions. Which mathematical operation given below is physically meaningful?

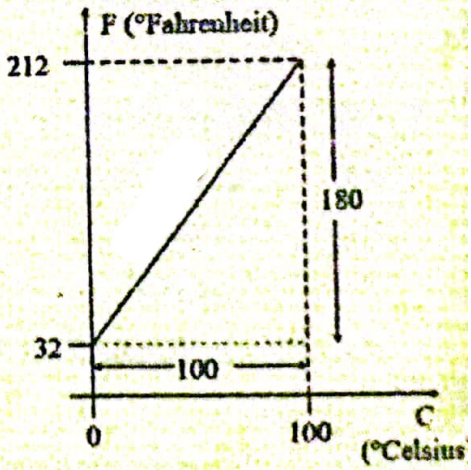
   a) $\frac{A}{B}$ b) $A + B$ c) $A - B$ d) $A = B$

2. A dimensionless physical quantity

   a) never has unit b) may have unit
   c) must have unit d) never exists

3. The graph between °F and °C scale is represented by straight line which makes an angle α with Celsius axis. The value of Secα is:

   a) $\frac{\sqrt{106}}{5}$ b) $\frac{\sqrt{106}}{9}$
   c) $\frac{5}{\sqrt{106}}$ d) $\frac{9}{\sqrt{106}}$



4. During the reflection of light

   a) wave length remain unchanged b) velocity remain unchanged
   c) frequency remain unchanged d) all of the above

Group B

Short Answer Questions. [3 × 5 = 15]

5. a. Check the dimensional correctness of the formula $v^2 = u^2 + 2as$, where symbols carry their usual meanings. [2]

   b. The velocity 'v' of a particle at time 't' is given as $v = at + \frac{b}{(t+c)}$, where a, b, c, are constants. Find the dimensions of a, b & c. [3]

6. a. Define Thermal equilibrium. [1]

   b. Student claimed that thermometers are useless because a thermometer always registers its own temperature. How would you respond? [2]

   c. At what point of thermometric Scale does the kelvin scale reading coincide with Fahrenheit scale reading? [2]

7. a. Which mirror is also the converging mirror and why? [2]

   b. Draw the types of spherical mirror and write its uses. [2]

   c. How can you distinguish the images? [1]

Group C

Long Answer Questions. [2 × 8 = 16]

8. a. In the wave equation $y = rsin(\omega t - kx)$, where 't' is time and 'x' is distance, find the dimensions of ω and k. [2]

   b. Convert 1 J into ergs using dimensional analysis. [2]

   c. The time-period of oscillation 'T' of simple pendulum depends upon mass 'm' of bob, length 'l' of string and acceleration due to gravity 'g'. Using dimensional analysis show that $T = 2\pi\sqrt{\frac{l}{g}}$. [3]

   d. Obtain the dimensional formula for specific heat capacity. [1]

9. a. Define absolute zero. [1]

   b) A Centigrade and a Fahrenheit thermometer are placed in hot water. The water is then cooled. What fall of temperature will the Fahrenheit thermometer register, when the Centigrade thermometer records the fall in temperature as 45°C? [2]

   c. Define reflection of light. [1]

   d. State laws of reflection with figure. [2]

   e. Differentiate between types of reflection. [2]

Chemistry

Group A

Multiple Choice Questions [4 × 1 = 4]

Rewrite the best option in your answer sheet.

1. Percentage of hydrogen in water is

   a) 11.12 b) 5.55 c) 22.24 d) 88.88

2. An oxidizing agent is a substance that can

   a) accept electron b) donate electron

   c) accept proton d) donate proton

3. Which of the following compound is ionic in nature?

   a) CO_2 b) H_2O

   c) NH_3 d) NaCl

4. The molecular formula of calcium nitrite is

   a) Ca_3N_2 b) Ca_3NO_2

   c) $Ca(NO_2)_2$ d) $Ca(NO_3)_2$

Group B

Short Answer Questions. [3 × 5 = 15]

5. a. Write the molecular formula of given compounds: [3]

   i. Bleaching powder ii. Plaster of Paris

   iii. Quick lime iv. Lime stone

   v. Baking soda vi. Blue vitrol

   b. Calculate the molecular mass of H_2SO_4 and $CaCl_2$. [2]

6. a. Define oxidation and reduction in terms of modern concept (electronic concept) with example. [2]

b. For the reaction,

$FeCl_3 + SnCl_2 \rightarrow SnCl_4 + FeCl_2$

i. Why is the given reaction is redox reaction? [1]

ii. Which species is oxidizing agent? [1]

iii. Which species is reducing agent? [1]

7. a. Define electro valency and covalency with example. [2]

b. Draw electron dot structure of

i. C_2H_2 ii. NH_3 iii. CO_2 [3]

Group C

Long Answer Questions. [2 × 8 = 16]

8. a. Define isotope and isobar with example. [2]

b. In which scale atomic mass is expressed? What does it mean? [1]

c. Why mass number is whole number where as average atomic mass is fractional? [2]

d. What is octet rule? [1]

e. What are valence electrons? [1]

f. Calculate the valence and core electrons of sulphur atom. [1]

9. a. Define oxidation number. [1]

b. Calculate the oxidation number of the underlined element in the following compounds: [4]

i. $K\underline{Mn}O_4$ ii. $\underline{C_6}H_{12}O_6$ iii. $\underline{Cr_2}O_7^{--}$ iv. $K_4[\underline{Fe}(CN)_6]$

c. What is covalent bond? What are the conditions of formation of covalent bond? [2]

d. Why does ionic compound do not conduct electricity in solid state? [1]

The End