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**NORTHWEST ACCREDITATION COMMISSION, USA
HIGH SCHOOL DIPLOMA (Sr. Secondary/12th) 2018-2019**

Subject- PHYSICS (PRACTICAL)

Question Paper No. :

P	H	9	2
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Subject Code : PPH1204

Question Paper Code:

P	P	6	8
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Total Time: 01.30 Hours.

Total Marks: 30

GENERAL INSTRUCTIONS

1. OPENING AND CHECKING OF THE QUESTION-BOOKLET

Break open the seal of the Question-Booklet only when the announcement is made by the Invigilator. After breaking the seal and before attempting the questions, student should immediately check for:

- a) The number of the printed page in the Question-Booklet is the same as mentioned on the cover page of the Booklet and
- b) Any printing error in the Booklet pages, if any.
Any discrepancy or error should be brought to the notice of the Invigilator who will then replace the Booklet. No additional time will be given for this.

2. No student, without the permission of the Superintendent, or the Invigilator concerned, is to leave his/ her seat or the Examination Room.

3. FILLING UP THE REQUIRED INFORMATION ON QUESTION-BOOKLET AND ANSWER SHEET

After breaking open the seal and checking the Booklet, student should:

- a) Fill up the **Question Paper No. and Question Paper Code** (mentioned on the cover of Question-Booklet) in the space provided on the First Answer Sheet.
- b) Fill up his/her Roll Number on the First Answer Sheet and on each Supplementary Answer Sheet, if taken.
- c) Student should mention the total number of **Supplementary Answer Sheet**, if taken, in the space provided on the First Answer Sheet and also fill up the Serial Number mentioned on each **Supplementary Answer Sheet** along with his/her Roll Number in the register maintained by the Invigilator. Student must tie all the Answer Sheets with the thread provided by the Invigilator.

4. INSTRUCTIONS ABOUT QUESTION PAPER

- a) This Question Paper includes five questions. All questions are compulsory.
- b) All questions are carrying six marks each in approximately 80-120 words.

5. Student found in possession of Cellular Phone / Mobile Phone / Pager or any other Communication Device and/or any Book/Note whether using or not, will be liable to be debarred for taking examination(s) either permanently or for specified period or/and dealt with as per law or/and ordinance of the School/SERI according to the nature of offence, or/and he/she may be proceeded against and shall be liable for prosecution under the relevant provision of the Statutory Law.

THE ANSWER SHEET IS TO BE RETURNED ON COMPLETION OF THE TEST

This Question Paper MUST be attached with Answer Sheet

- Question 1.**
- (a) In Rutherford scattering experiment, draw the trajectory traced by α -particles in the coulomb field of target nucleus and explain how this led to estimate the size of the nucleus.
 - (b) Describe briefly how wave nature of moving electrons was established experimentally.
 - (c) Estimate the ratio of de-Broglie wavelengths associated with deuterons and α -particles when they are accelerated from rest through the same accelerating potential V .

OR

- (a) Draw a ray diagram showing the image formation by a compound microscope. Obtain expression for total magnification when the image is formed at infinity.
- (b) How does the resolving power of a compound microscope get affected, when
 - (i) focal length of the objective is decreased.
 - (ii) the wavelength of light is increased?Give reasons to justify your answer.

- Question 2.**
- (a) Define a wavefront. How is it different from a ray?
 - (b) Depict the shape of a wavefront in each of the following cases.
 - (i) Light diverging from point source.
 - (ii) Light emerging out of a convex lens when a point source is placed at its focus.
 - (iii) Using Huygen's construction of secondary wavelets, draw a diagram showing the passage of a plane wavefront from a denser into a rarer medium.

OR

- (a) Draw a schematic arrangement of Geiger-Marsden experiment showing the scattering of α -particles by a thin foil of gold. Why is it that most of the α -particles go right through the foil and only a small fraction gets scattered at large angles?
Draw the trajectory of the α -particle in the coulomb field of a nucleus. What is the significance of impact parameter and what information can be obtained regarding the size of the nucleus?
- (b) Estimate the distance of closest approach to the nucleus ($Z = 80$) if a 7.7 MeV α -particle before it comes momentarily to rest and reverses its direction.

- Question 3.** (a) Write two important limitations of Rutherford model which could not explain the observed features of atomic spectra. How were these explained in Bohr's model of hydrogen atom? Use the Rydberg formula to calculate the wavelength of the H_{α} line. (Take $R = 1.1 \times 10^7 \text{ m}^{-1}$).
- (b) Using Bohr's postulates, obtain the expression for the radius of the n th orbit in hydrogen atom.

OR

- (a) State Raoult's law for a solution containing volatile components. How does Raoult's law become a special case of Henry's law?
- (b) 1.00 g of a non-electrolyte solute dissolved in 50 g of benzene lowered the freezing point of benzene by 0.40 K. Find the molar mass of the solute. (K_f for benzene = $5.12 \text{ K kg mol}^{-1}$)

- Question 4.** (a) Define the following terms:
- Ideal solution
 - Azeotrope
 - Osmotic pressure
- (b) A solution of glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) in water is labelled as 10% by weight. What would be the molality of the solution? (Molar mass of glucose = 180 g mol^{-1})

OR

- (a) Why do transition elements show variable oxidation states?
- name the elements showing maximum number of oxidation states among the first series of transition metals from Sc ($Z = 21$) to Zn ($Z = 30$)
 - Name the element which shows only +3 oxidation state
- (b) What is lanthanide contraction? Name an important alloy which contains some of the lanthanoid metals.

- Question 5.** (a) Write the products formed when CH_3CHO reacts with the following reagents:
- HCN
 - $\text{H}_2\text{N}-\text{OH}$
 - CH_3CHO in the presence of dilute NaOH

(b) Give simple chemical tests to distinguish between the following Pairs of compounds.

(i) Benzoic acid and Phenol

(ii) Propanal and Propanone

OR

(a) What are emulsions? What are their different types? Give one example of each type.

(b) Write the principle behind the froth floatation process. What is the role of collectors in this process?

END OF THE QUESTION PAPER