

**NORTH-EX PUBLIC SCHOOL**  
**(Senior Secondary, Affiliated To CBSE)**  
**School Block, Jain Nagar, Sector-38, Rohini, Delhi – 81**  
**WINTER VACATION HOMEWORK (2019-2020)**

**CLASS – XI A**

**PHYSICS**

1. The escape velocity ( $v$ ) of a body depends upon the mass ( $m$ ) of body, gravitational acceleration ( $g$ ) and radius ( $R$ ) of the planet. Derive the relation for escape velocity dimensionally.
2. State and prove Bernoulli's theorem. Explain any one application of it.
3. A liquid drop of diameter 4mm breaks into 1000 droplets of equal size. Calculate the resultant change in energy. (The surface tension of the liquid is 0.07 N/m)
4. Define molar specific heat capacities at constant volume and pressure. Show that  $C_p - C_v = R$ . Where Symbols have their usual meaning.
5. Explain with reason: The volume of an ideal gas is  $V$  at a pressure  $P$ . On increasing the pressure by  $\Delta P$ , the change in volume of the gas ( $\Delta V_1$ ) under isothermal and ( $\Delta V_2$ ) under adiabatic conditions. Is  $\Delta V_1 > \Delta V_2$  or vice-versa

**BIOLOGY**

1. Diffusion of gases occurs in the alveolar region only and not in the other parts of respiratory system. Why?
2. Explain the events in the cardiac cycle. Describe 'double circulation'.
3. Explain the micturition and disorders of the excretory system.
4. Describe the important steps in muscle contraction.
5. Briefly describe the structure of the following:  
(a) Brain (b) Eye (c) Ear

**MATHEMATICS**

1. Write the anti derivative of  $\sin^2 x \cos^2 x$  ?
2. Give two examples of an equivalence relation and explain why its an equivalence relation.
3. Find the rate of change of area of a circle when radius is 5 cm ?
4. Make a list of all the properties of determinants.
5. Make a list of all the properties of definite integrals.

**PHYSICAL EDUCATION**

1. Write the importance of friction in sports.
2. Write the properties of muscle.
3. What do you mean by a good health?
4. Write the characteristics of a good athlete.
5. Why is warm up so important before any sporting activity?

## ENGLISH

1. “The immune system works best when you are sleeping”. Taking tips from the notes given below, write an article in about 100-120 words on the effects of sleep disorder on our immune system.  
You are Aditi / Aditya.  
Leads to an array of health  
7 to 8 hours of sleep a day  
Natural killer cells generate while we sleep  
Consistency strengthen immune system
2. You are a press reporter. You have interviewed passengers of a hijacked plane to know their experience. Sum up their experience in 150 words as a report for a newspaper.
3. You have to deliver a speech in the morning assembly on the topic ‘The increasing rate of crime in today’s society’. Write the speech in about 150-200 words.
4. Write an article for your school magazine justifying the need of education for girls in the country for national development.

## CHEMISTRY

1. Do all questions of the given assignment in separate notebook.
2. Do all exercise questions of S- block and P-block elements in homework notebook
3. write 4 preparations of each of the following:  
A. Alkane B. Alkene C. Alkyne D. Benzene
4. Read chapter-16 Environmental chemistry.
5. Explain electrophilic substitutions reaction with mechanism.

## COMPUTER SCIENCE

1. What measures would you take to avoid:  
a) Virus attack b) Spam
2. What do you understand by Phishing?
3. Define Data Encryption.
4. Write SQL commands for the following on the basis of the given table teacher:

No.	Name	Age	Department	Date Of Joining	Salary
1	Joseph	34	Computer	10/01/97	20000
2	Sahil	31	History	24/03/98	22000
3	Sandeep	32	Maths	12/12/96	30000
4	Rakesh	35	History	01/07/99	40000
5	Sulekha	44	Computer	25/02/97	25000

- a) To show all information about the teacher of History department.  
b) To list the names of female teachers who are in computer department.  
c) To list names of all teachers with their joining in ascending order.
5. a) What is the use of encoding schemes?  
b) What is code space? How is it related to code point?