# Dr. Virendra Swarup education centre, jajmau

# Class- Xl

# Winter  Holiday Homework (2025 - 26)

**HINDI:-**

1. निम्न विषयों पर रचनात्मक लेख लिखें।

 क. अपना हरिद्वार कुंभ - नगरी

  ख. सोशल मीडिया वरदान या अभिशाप

2. आपके विद्यालय में आयोजित काव्य पाठ में आपको पुरस्कार मिला है इस अनुभव को डायरी में लिखें।

3. विद्यालय की प्रधानाचार्या को अपना स्थानांतरण प्रमाण पत्र मांगने के लिए पत्र लिखें।

(सभी कार्य व्याकरण उत्तर पुस्तिका में किए जाएंगे)

**BIOLOGY:-**

1. Complete your project file.
2. Complete the notes of the Human Physiology unit.
3. Solve NCERT Exemplar questions of the Human Physiology unit.

**MATHS:-**

Solve NCERT exercises of the following chapters in your fair notebook.

- Chapter : Straight Lines
- Chapter : Conic Sections
- Chapter : Limits and Derivatives

**CHEMISTRY:-**

Solve the following questions from NCERT in Chemistry notebook:

- Chapter: Thermodynamics

  5.5 , 5.8 , 5.9, 5.10, 5.11 ,5.12, 5.14 , 5.15 ,5.17 and 5.19

- Chapter: Equilibrium
  6.3 to 6.6,  6.8, 6.9,  6.11,  6.16, 6.20 , 6.29,  6.39,  6.43, 6.48, 6.49 and 6.55

- Chapter : Redox Reactions

   7.13 , 7.18  , 7.19 ,7.22 , 7.26 , 7.29 , 7. 30


**ENGLISH:-**

1. On the basis of your study of the lesson Silk Road, write a travelogue of a place visited by you.Discuss your experience, the landscape and it's impact on you. Use two comment sheets and three art sheets.
2. Write a speech to be delivered in the morning assembly of your school on generational gap based on your study of the poem 'Father to son'.
3. On the basis of your study of the poem 'childhood' by Markus Nattan make a diary entry about your feelings on the loss of the carefree childhood days.


**PHYSICS:-**

- Investigate the various factor – affecting Time period of simple pendulum
  Roll No – 1, 6, 11 ,16 , 21 ,26, 31, 35
- Study range ,height and trajectory for a projectile motion
  Roll No – 2, 7 ,12, 17 ,22, 27, 36
- Study and verify the relationship between stress and strain for different materials Hook's Law
  Roll No – 3, 8, 13, 18, 23, 28, 32
- Determine the coefficient of friction for different surfaces

Roll No – 4, 9, 14, 19, 24, 29, 33
- Compare rolling times for different shapes ( sphere, cylinder, ring)
  Roll No – 5, 10, 15, 20, 25 , 30, 34
- **Complete the worksheet in your fair notebook.**

1. What do you mean by Steady state, Temperature gradient and Thermal resistance in thermal conduction?
2. Define the coefficient of thermal conductivity and also give its unit and dimensional formula.
3. Two metallic rods having same cross section area and of thickness l1 and l2 and thermal conductivities K1 and K2 are joined in series. Then derive the expression of equivalent thermal resistance and hence show that their equivalent thermal conductivity is:

$$K = \frac{l_1 + l_2}{\left(\frac{l_1}{K_1} + \frac{l_2}{K_2}\right)}$$

   If thickness l1 and l2 of both the rods is same, then show that the equivalent thermal conductivity is the harmonic mean (HM) of the thermal conductivities $K_1$ and $K_2$.
4. Heat is conducted through a compound plate composed of two parallel plates A and B of different materials. A and B are respectively 3.6 cm and 4.2cm thick. Their coefficients of thermal conductivities are 0.32 and 0.14 respectively. If, in the steady state, the temperatures of the outer surfaces of A and B are 96°C and 8°C respectively, find the temperature of their interface.
5. Two metallic rods having same thickness and of cross section area $A_1$ and $A_2$ and thermal conductivities $K_1$ and $K_2$ are joined in parallel. Then derive the expression of equivalent thermal resistance and hence show that their equivalent thermal conductivity is:

$$K = \frac{K_1 A_1 + K_2 A_2}{A_1 + A_2}$$

    If cross section area of both the rods is same, then show that the equivalent thermal conductivity is the Arithmetic mean (AM) of the thermal conductivities $K_1$ and $K_2$.
6. What is Wien's displacement law? Give the value of Wien's constant. Two stars X and Y emit maximum radiations at 4800 angstrom and 6000

angstrom respectively. If the temperature of the star Y is 5800 K, then what is the temperature of star X?

7. Derive the expression for work done in adiabatic process. Hence show that the work done depends upon the initial and final temperatures.

8. Discuss First law of thermodynamics. What are the limitations of the First law of thermodynamics and why second law of thermodynamics is needed? Discuss the Kelvin –Planck and\or Clausius statement of Second law of thermodynamics.

9. Discuss the two specific heats of gases. Derive the Mayer's relation for the difference in molar specific heats.

10. Discuss the Law of Equipartition of energy. Using the law of Law of Equipartition of energy derive the expression of the ratio of two specific heats: in terms of degree of freedom (f). Hence obtain the value of the ratio of two specific heats in case of Mono, Di and Tri-atomic gases.

11. What are the postulates of Kinetic theory of gases? On the basis of Kinetic theory of gases, derive the expression for pressure of an ideal gas. Hence show that the pressure of a gas is equal to two-thirds of its translational kinetic energy per unit volume.

12. Regarding radiation which of the following statement is wrong.

    (a)Radiation is the process by which heat is transferred directly from one .
       body to another, without requiring any medium.

    (b)Radiation is the fastest mode of heat transfer from one place to another
       as in this mode heat energy is propagated at speed of light.

    (c) The electromagnetic waves of wavelength ranging from 0.0001 mm
       to i mm are called infrared radiation or heat radiation.

    (d) As all bodies radiate energy at all times, radiation from a body can
       never be stopped but can be minimized.

    (e) None of the above

13. Regarding radiation which of the following statement is wrong.

(a) Radiation does not affect the medium through which it passes.

(b) Rough and dark (i.e., black) surfaces are good absorbers while shining and .
smooth surfaces are good reflectors of heat radiation.

(c) Heat radiations are invisible and like light, travel in straight lines, cast . shadow, affect photographic plates and can be reflected by mirrors and refracted by lenses.

(d) Blackbody radiation is white (White radiation includes all possible wavelengths. Since a blackbody absorbs radiation of all wavelengths, so on being heated to a suitable temperature it will emit radiation of all wavelengths)

(d) None of the above

14. What will be effect on internal energy when a big drop of radius R is broken in to n droplets of Equal Volume?

15. Explain, water wets glass surface but mercury does not.

16. Explain why steel is more elastic than rubber?

17. Explain why hot soup is tastier than cold one?

18. Explain coefficient of viscosity and it's dimension?

19. The poisson's ratio of a material is 0.20 if the longitudinal strain in the rod of this material be $4.0 \times 10^{-3}$, then determine the percentage change in the volume of it.

20. The area of cross – section of a wire and its length are 1mm2 and two meter respectively. How much will be the work done to increase its length by 0.1mm? Young's modulus of the material of the wire $= 2.0 \times 10^{11}$. $N/m^2$.

21. Define angle of contact. What is capillarity? Derive the formula for the rise of liquid in capillary tube.

22. Derive the formula for excess inside the soap bubble.

23. If a body of mass M is divided in two parts .then what will be relation between the masses so that the force acting between them is maximum.

24. A rod of length 1.05m having negligible mass is supported at its ends by two wires of steel (wire A) and aluminium (wire B) of equal length as shown n figure. The cross – section areas of wires

A & B are 1.0mm2 and 2.0mm2 respectively. At what point

Along the rod should the mass m be suspended in the order to produce . for steel $Y = 2 \times 10^{11}$ N/m$^2$

For AIY=7 $\times 10^{11}$ N/m$^2$

(a) Equal stresses and

(b) Equal strains in both steel and aluminium wires.

25.(a) What is poisson's ratio? Discuss its dimensions and limiting value.

(b) A material has poisson's ratio 0.5 in a uniform rod suffers a longitudinal strain of 0.002. What is the % increase in volume?

26.(a) What is the property of ideal liquid? Explain the term critical velocity. And differentiate Between stream lined and turbulent flow.
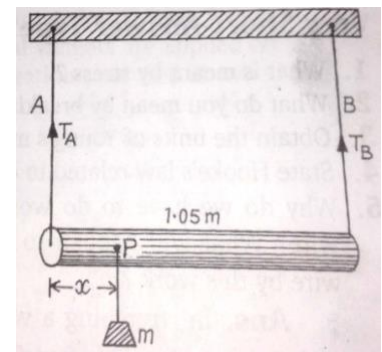
   (b) Obtain the formula for terminal velocity. And explain why rain drops are spherical.

27.If a big drop of radius R is broken into n droplets of equal volume. Then show that the rise in temperature, where J is mechanical equivalent of heat.

28. Water flows steadily through a horizontal pipe of varying diameter. The pressure of water is 1.0cm. Of mercury column at a point where the velocity of flow is 0.35m/sec. Find the pressure at other. Where the velocity of flow is 0.65m/sec. If density of mercury and water is 13600 and1000kg/m3.

29.(a)  What is escape velocity? Establish the relation between escape velocity and orbital velocity.

   (b )  Define geostationary satellite. Obtain the height for a geostationary satellite.



30. Show that effective acceleration due to gravity decreases on going h depth below the earth surface. Assuming the earth to be a sphere of uniform mass density how much would a body weigh half way down to the centre of earth if the weighted 250N on the earth surface.

(a) State and prove Bernoulli's theorem for an ideal liquid in the form of pressure head, Velocity head, and gravitational head and their dimensions?

# COMPUTER SCIENCE:-

## Python Programs

- Input a welcome message and display it.
- Input two numbers and display the larger / smaller number.
- Input three numbers and display the largest / smallest number.
- Generate the following patterns using nested loops:

| Pattern-1 | Pattern-2 | Pattern-3 |
|---|---|---|
| *<br>**<br>***<br>****<br>***** | 12345<br>1234<br>123<br>12<br>1 | A<br>AB<br>ABC<br>ABCD<br>ABCDE |

- Write a program to input the value of x and n and print the sum of the following series:

  □ $1 + x + x^2 + x^3 + x^4 + \cdots x^n$

  □ $1 - x + x^2 - x^3 + x^4 - \cdots x^n$

  □ $x + \dfrac{x^2}{2} + \dfrac{x^3}{3} + \dfrac{x^4}{4} + \cdots \dfrac{x^n}{n}$

  □ $x + \dfrac{x^2}{2!} + \dfrac{x^3}{3!} + \dfrac{x^4}{4!} + \cdots \dfrac{x^n}{n!}$

- Determine whether a number is a perfect number, an Armstrong number or a palindrome.

- Input a number and check if the number is a prime or composite number.
- Display the terms of a Fibonacci series.
- Compute the greatest common divisor and least common multiple of two integers.

- Count and display the number of vowels, consonants, uppercase, lowercase characters in string.

- Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.

- Find the largest/smallest number in a list/tuple
- Input a list of numbers and swap elements at the even location with the elements at the odd location.

- Input a list/tuple of elements, search for a given element in the list/tuple.
- Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have marks above 75.