SUGHAR SINGH ACADEMY (SWARN JAYANTI VIHAR)
SUMMER VACATION HOLIDAY HOMEWORK (2024-25)
CLASS-XI (Science)

English	Do the project on the topic - Discovering Tut - The Saga Continues.
Hindi	1- ग्रीष्म कालीन अवकाश के किन्हीं 5 दिनों का अनुभव अपनी डायरी में लिखिए। 2- परियोजना कार्य (प्रोजेक्ट फाइल) तैयार करें। कवि या लेखक परिचय, संचार के माध्यम (अखबार, रेडियो, टेलीविजन, इंटरनेट)
Physics	Do the given sheet.
Chemistry	Do the given sheet.
Biology	Prepare a project file on the allotted topics.
Maths	Do the given sheet.
Computer	1- Draw a flowchart and write an algorithm to accept a number and display its table. 2- Draw a flowchart and write the algorithm to display sum of the following series: S=1!+2!+3!+...+10! 3- Draw a flowchart and write an algorithm to accept three numbers and display the largest of them. 4- Draw a flowchart and write an algorithm to find the sum of the first 20 natural numbers. 5- Write an algorithm that accepts four numbers as input and find the largest and smallest of them. Also Write draw the flowchart. 6- Draw a flowchart to find the average of three numbers. 7- Draw a flowchart to calculate the area of a triangle when its three sides are given. 8- Draw a flowchart to find the reverse of a number input by the user. Also Write the algorithm. 9- Draw a flowchart to find the sum of digits of a number. Also Write the algorithm. 10- Draw a flowchart to print the first 8 multiples of 3. Also Write the algorithm.
Physical Education	1. Play outdoor activity as per interest at least 2 hours. 2. Perform yogasan every morning and send images. 3. Learn all topics of physical education. 4. Prepare a labeled chart of any game.

SUGHAR SINGH ACADEMY

Holiday Homework-Mathematics

Class-XI

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1. Write the following sets in the roster form-
   (a) $A = \{x : x \text{ is a natural number }, 6 \leq x \leq 15\}$
   (b) $B = \{x : x \text{ is a real number }, 6 \leq x \leq 15\}$
   (c) $C = \{x : x \text{ is a perfect square and } x < 50\}$
   (d) $D = \{x : x \in R \text{ and } x^3 - 6x^2 + 11x - 6 = 0\}$
   (e) $E = \{x : x \in Z \text{ and } -\frac{1}{2} < x < \frac{13}{2}\}$
   (f) $F = \{x : x \in R, |x| \leq 3\}$
2. Write the following sets in set-builder form-
   (a) $A = [-1, 1)$
   (b) $B = \{\frac{1}{2}, \frac{2}{5}, \frac{3}{10}, \frac{4}{17}, \frac{5}{26}, \frac{6}{37}, \frac{7}{50}\}$
3. Write down all subsets of each of the following sets-
   A. $P = \{-1, 0, 1\}$ B. $Q = \emptyset$ C. $R = \{2, \{3\}\}$ D. $S = \{0, 1, \{2, 3\}\}$
4. If $A \subset B, B \subset A$, then prove that $A = B$.
5. If $A = (2, 4)$ and $B = [3, 5)$, then find $A \cap B$.
6. If $A = \{\frac{1}{x} : x \in N \text{ and } x < 8\}$ and $B = \{\frac{1}{2x} : x \in N \text{ and } x \leq 4\}$, then find
   A. $A \cup B$ B. $A \cap B$ C. $A - B$ D. $B - A$
7. If $A = \{a, b, c, d, e\}, B = \{a, c, e, g\}$ and $C = \{b, e, f, g\}$, then find-
   A. $A \cap (B - C)$ B. $A - (B \cup C)$ C. $A - (B \cap C)$
8. If $A = \{x : x \in N, x \leq 7\}, B = \{x : x \text{ is a prime }, x < 8\}$ and $C = \{x : x \in N, x \text{ is odd and } x < 10\}$,then verify that-
   (a) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
   (b) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
9. For any sets A and B, using venn-diagram, prove that-
   (a) $(A - B) \cap B = \emptyset$
   (b) $A \cup (B - A) = A \cup B$
   (c) $(A - B) \cup (A \cap B) = A$
   (d) $A \cap B' = \emptyset \Rightarrow A \subset B$
   (e) $A' \cup B = U \Rightarrow A \subset B$
   (f) $A \subset B \Rightarrow B' \subset A'$

10. If $X = (-\infty, 5)$ and $Y = (4, \infty)$, then find-

    A. $X \cap Y$ B. $X \cup Y$ C. $X - Y$ D. $Y - X$

11. Let $A = \{x : x \in W, x < 3\}, B = \{x : x \in N, 1 < x \leq 4\}$ and $C = \{x : x^2 - 8x + 15 = 0\}$, then verify that-

    (a) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

    (b) $A \times (B \cap C) = (A \times B) \cap (A \times C)$

12. Let $R = \{(x, y) : x + 3y = 12, x \in N \text{ and } y \in N\}$.

    (a) Write R in roster form.

    (b) Find dom(R) and range(R).

13. Let $R = \{(x, y) : x, y \in Z \text{ and } x^2 + y^2 \leq 4\}$.

    (a) Write R in roster form.

    (b) Find dom(R) and range(R).

14. If $f(x) = \frac{x-1}{x+1}$, then show that $f(\frac{1}{x}) = -f(x)$.

15. Find the domain and range of the following functions-

    (a) $f(x) = \frac{x-3}{x+5}$

    (b) $f(x) = \frac{x+4}{2x-3}$

    (c) $f(x) = \frac{x^2+1}{x^2-1}$

    (d) $f(x) = \sqrt{2-x}$

    (e) $f(x) = \sqrt{4-x^2}$

    (f) $f(x) = \sqrt{x^2-4}$

    (g) $f(x) = \frac{x}{x^2+1}$

    (h) $f(x) = \frac{1}{\sqrt{x-1}}$

    (i) $f(x) = \sec x$

    (j) $f(x) = \sqrt{\frac{x-5}{3-x}}$

    (k) $f(x) = \frac{1}{x^2}$

16. The minute hand of a watch is 1.4 cm long. How far does its tip move in 45 minutes? (Use $\pi = \frac{22}{7}$)

17. Find the value of the following-

    A. $\sin(\frac{31\pi}{3})$ B. $\cos(\frac{17\pi}{2})$ C. $\tan(-\frac{25\pi}{3})$ D. $\cot(\frac{13\pi}{4})$ E. $\sec(-\frac{25\pi}{3})$ F. $\text{cosec}(-\frac{41\pi}{4})$
    G. $\cot(585^\circ)$ H. $\cos(-2220^\circ)$ I. $\sin(-1470^\circ)$ J. $\text{cosec}\,(-1500^\circ)$

18. Do all the exercises of first 3 chapters of NCERT..

19. Prove that $\cos 130^\circ \cos 40^\circ + \sin 130^\circ \sin 40^\circ = 0$

20. Prove that $\cos x + \cos(\frac{2\pi}{3} + x) + \cos(\frac{2\pi}{3} - x) = 0$

21. Do Activity 1 to Activity 7 from Arihant Lab Manual.

Sughar Singh Academy (Swarn Jayanti Vihar)
Class-XI (Physics)
Holiday Homework 2024-25

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1. A thin wire has a length of 21.7 cm and radius 0.46 mm. Calculate the volume of the wire to correct significant figures.
2. The frequency (f) of a stretched string depends upon the tension F (dimensions of force), length l of the string and the mass per unit length λ of string. Derive the formula for frequency.
3. The energy E of an oscillating body in simple harmonic motion depends on its mass m, frequency n and amplitude a. Using the method of dimensional analysis find the relation between E, m, n and a.
4. A ball is thrown upwards from the top of a tower 40 m high with a velocity of 10 m/s. Find the time when it strikes the ground. Take $g = 10\ m/s^2$.
5. A ball is thrown upwards from the ground with an initial speed of u. The ball is at a height of 80 m at two times, the time interval being 6 s. Find u. Take $g = 10\ m/s^2$.
6. A particle is projected vertically upwards with velocity 40 m/s. Find the displacement and distance travelled by the particle in (a) 2 s (b) 4 s (c) 6 s. Take $g = 10 m/s^2$.
7. A particle starts with an initial velocity 2.5 m/s along the positive x-direction and it accelerates uniformly at the rate $0.50\ m/s^2$.
   (a) Find the distance travelled by it in the first two seconds
   (b) How much time does it take to reach the velocity 7.5 m/s?
   (c) How much distance will it cover in reaching the velocity 7.5 m/s?
8. Displacement-time equation of a particle moving along x-axis is $x = 20 + t^3 - 12t$ (SI units)
   (a) Find, position and velocity of particle at time t = 0.
   (b) State whether the motion is uniformly accelerated or not.
   (c) Find position of particle when velocity of particle is zero.
9. The motion of a particle along a straight line is described by the function x = (2t - 3) 2, where x is in metres and t is in seconds. Find
   (a) The position, velocity and acceleration at t = 2 s.
   (b) The velocity of the particle at origin.
10. A ball is projected vertically upward with a speed of 50 m/s. Find (a) the maximum height, (b) the time to reach the maximum height, (c) the speed at half the maximum height. Take $g = 10\ ms^{-2}$.

Sughar Singh Academy (Swarn Jayanti Vihar)
Class-XI (Chemistry)
Holiday Homework 2024-25

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1. How many significant figures are present in
(a) 4.01×10^2
(b) 8.256
(c) 100
2. Vitamin C is essential for the prevention of scurvy. Combustion of 0.2000g of vitamin C gives 0.2998g of CO_2 and 0.819g of H_2O. What is the empirical formula of vitamin C?
3. What designations are given to the orbitals having
(i) n = 2, l = 1 (ii) n = 2, l = 0 (iii) n = 4, l = 3
(iv) n = 4, l = 2 (v) n = 4, l = 1?
4. Write the electronic configuration of (i) Mn^{4+}, (ii) Fe^{3+} (iii) Cr^{2+} and Zn^{2+} Mention the number of unpaired electrons in each case.
5. What is the mass (m) of an electron?
6. Which experiment led to the discovery of electrons and how?
7. Give the main properties of canal ray experiment.
8. Find out atomic number, mass number, number of electron and neutron in an element $^{40}_{20}\times$?
9. Give the main features of Thomson's Model for an atom.
10. What did Rutherford conclude from the observations of $\alpha - ray$ scattering experiment?
11. Project Study of the methods of purification of water
12. Periodic table working model