

VISHWA BHARATI PUBLIC SCHOOL, DWARKA
SESSION 2019-20
HOLIDAY HOMEWORK
CLASS XI (Science Stream)

ENGLISH:

1. Prepare a poster on any one of the following:
 - (a) Water conservation / Rain harvesting
 - (b) Blood donation
 - (c) Care for animals
2. Write an Article, Letter, and Speech on any social/environmental issue which you feel strongly about.

PHYSICS:

1. Revise the covered syllabus and do the exercise questions.
2. Prepare a Physics project file.
3. Solve the following questions:
 - a) The length, breadth and thickness of a rectangular sheet of metal are 4.234 m, 1.005 m and 2.01 cm, respectively. Find area and volume of sheet to correct number of significant figures.
 - b) A physical quantity P is given by relation:

$$P = \frac{a^3 b^2}{\sqrt{cd}}$$

The percentage errors in a, b, c and d are 1%, 3%, 4% and 2% respectively. What is the % error in the quantity P?

- c) Define the terms: Absolute error, Mean absolute error, Relative error and Percentage error.
- d) If the units of force, velocity and energy are 100 dyne, 10 cm/s and 400 ergs, respectively, what will be the unit of mass, length and time?
- e) Give the number of significant figures in the following:
 - a. 0.009 cm
 - b. 0.540 m
 - c. 2.52×10^{12} kg
 - d. 5.670 J
 - e. 2505.50 calorie
- f) Find dimensional formulae for the following:
 - a. Charge
 - b. Potential
 - c. Resistance
 - d. Capacitance
 - e. Coefficient of viscosity
- g) A small spherical ball of radius r falls with velocity v through a liquid having coefficient of viscosity η . Find the viscous drag force on the ball assuming it depends on η , r and v (by the method of dimensions)

CHEMISTRY:

1. Prepare a Chemistry Project File on the topic of your choice.
2. Revise Ch-1 and 2. Do exercise questions in your notebook.
3. Do the following questions in your class notebook:
 - a) Calculate the number of molecules present in 0.5 moles of CO_2 ?
 - b) Calculate the number of moles in the following masses – (i) 7.85g of Fe (ii) 7.9mg of Ca
 - c) Sea water contains roughly 28.0 g of NaCl per liter. What is the molarity of sodium chloride in sea water?
 - d) Which one is more concentrated 1 M or 1m of solution? Give reason.
 - e) Calculate molarity of 98% (w/w) H_2SO_4 solution, having density 1.98g/mL
 - f) Take the reaction: $\text{NH}_3 + \text{O}_2 \rightarrow \text{NO} + \text{H}_2\text{O}$. In an experiment, 3.25 g of NH_3 are allowed to react with 3.50 g of O_2 .
 - a. Which reactant is the limiting reagent?
 - b. How many grams of NO are formed?
 - c. How much of the excess reactant remains after the reaction?
 - g) Determine the empirical formulas for compounds with the following percent compositions:
 - (a) 15.8% carbon and 84.2% sulphur
 - (b) 40% carbon, 6.7% hydrogen, 53.3% oxygen

BIOLOGY:

1. Make any 5 herbarium sheets of your choice.
2. Revise the covered syllabus and do the given NCERT questions.

- Do the discussed work in practical file.

PHYSICAL EDUCATION:

Do questions and answers of chapter-1 and 2.

COMPUTER SCIENCE:

- Revise topics covered in the class.
- Complete Exercise of L-1 and L-2

MATHS:

Solve the given worksheet:

- In a survey of 25 students, it was found that 15 has taken Maths, 12 had taken Physics and 11 had taken Chemistry, 5 has taken Maths and Chemistry, 9 had taken Maths and Physics, 4 had taken Physics and Chemistry and 3 had taken all the three. Find the number of students that had taken,
 - Only Chemistry
 - Only Maths
 - Only Physics
 - Physics and Chemistry but not Maths
 - Maths and Physics but not Chemistry
 - Only one of the subjects
 - At least one of the three subjects
 - None of the subjects
- If $A = \{2x : x \in \mathbb{N}\}$, $B = \{3x : x \in \mathbb{N}\}$, $C = \{5x : x \in \mathbb{N}\}$, then find
 - $A \cap B$
 - $B \cap C$
 - $(A \cap B) \cap C$
- Let A and B be two sets such that $n(A) = 20$, $n(A \cup B) = 42$, and $n(A \cap B) = 4$. Find (i) $n(B)$ (ii) $n(A - B)$ (iii) $n(B - A)$
- Let $U = \{x \in \mathbb{N} : x \leq 9\}$; $A = \{x : x \text{ is an even number, } 0 < x < 10\}$; $B = \{2, 3, 5, 7\}$. Verify that $(A \cup B)' = A' \cap B'$
- Write the Cardinal number of the following finite sets. (cardinal number is the number of distinct elements of a finite set)
 - $A = \{x : x \text{ is a prime factor of } 12\}$
 - $B = \text{The set of prime numbers less than } 17$
 - $C = \{x : x \text{ is a digit in the binary number system}\}$
 - $D = \text{The set of all vowels in the word MATHEMATICS}$
 - $E = \{x : x \in \mathbb{N} \text{ and } (x-1)(x+2) = 0\}$
 - $F = \{50, 51, 52, 53, \dots, 200\}$
 - $G = \{x : x \in \mathbb{Q} \text{ and } x^2 - 5 = 0\}$
 - $H = \{x : x \in \mathbb{C} \text{ and } x^2 + 1 = 0\}$; $\mathbb{C} = \text{set of complex numbers.}$
- Let $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{2, 3\}$, $B = \{3, 4, 5\}$. Find (i) $B' - A'$ (ii) $(B - A)'$
- In a group of 50 people, 14 drink fruit juice but not cold drink, 30 drink fruit juice and each person likes at least one of the 2 drinks. Find
 - how many drink fruit juice and cold drink both?
 - how many drink cold drink but not fruit juice?
- There are 2000 students in a school, out of which 1000 play cricket, 600 play basketball, 550 play football, 120 play cricket and basketball, 80 play basketball and football and 150 play cricket and football and 45 play all the three games. Find how many students play none of the three games.
- Determine the domain and range of the relation R defined by $R = \{(x + 1, x + 5) : x \in (0, 1, 2, 3, 4, 5)\}$
- Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be given by $f(x) = x^2 + 3$. Find (i) $\{x : f(x) = 28\}$ (ii) The pre-images of 39 and 2 under 'f'.
- Find the domain and range of $f(x) = \frac{x-2}{x-1}$
- Is $g(x) = \{(1,1), (2,3), (3,5), (4,7)\}$ a function? If this is described by the formula, $g(x) = \alpha x + \beta$, then what values should be assigned to α and β ? $A = (2, -1)$
- If $f(x) = \frac{x-1}{x+1}$, then show that (i) $f\left(\frac{1}{x}\right) = -f(x)$ (ii) $f\left(\frac{-1}{x}\right) = \frac{-1}{f(x)}$

14. Given $R = \{(x, y) : y = x - 3, x, y \in \mathbb{Z}\}$. State which of the following ordered pairs belong to the relation:
(i) (5,2) (ii) (1,2) (iii) (0, -3) (iv) (7, -4) (v) (-4, 1)
15. Let $f(x) = x^2 - x$ and $g(x) = x$ be two functions defined in the domain $\mathbb{R}^+ \cup \{0\}$, find :
(i) $(f + g)(0)$ (ii) $(f - g)(-1)$ (iii) $(fg)(1/2)$ (iv) $(f/g)(4)$
16. Let $A = \{1, 2, 3, 4, 6\}$. Let R be the relation on A defined by
 $R = \{(a, b) : a, b \in A, b \text{ is exactly divisible by } a\}$. Write R in roster form and its domain and range.
17. Let $f(x) = x + 1$, find $f(f(x))$.