Class 11 A
English Holiday Homework

1. Read the lessons:
   a) The Portrait of a Lady
   b) We are not afraid to die ...
   c) Discovering Tut

   Write the meanings of the hard words in your Notebook and frame meaningful sentences.

2. Solve the PT 1 Question Paper in your Notebook

PHYSICS

- ✓ Revise the content taught
- ✓ Practice numericals from NCERT and side books
- ✓ Solve the following questions on comment sheets and submit the work on the reopening day of school.

1) Why do we have different units for the same quantity?
2) The distance of a galaxy is of the order of 10^{25}m. Calculate the order of the magnitude of the time taken by light to reach us from galaxy.
3) If the unit of force is 100 N, unit of length is 10 m and the unit of time is 100 s, what is the unit of mass in this system of units?
4) A new system of units is proposed in which unit of mass is α kg, unit of length is β m and unit of time is γ sec. How much will be 5 J measured in this system?
5) How many astronomical units make one parsec?
6) A uniformly moving cricket ball is turned back by hitting it with a bat for a very short interval. Show the variation of its acceleration with time. (take acceleration in backward direction as positive)
7) Give example of a motion where x > 0, v < 0, a > 0 at a particular instant.
8) Derive equations of motion graphically and by using calculus.
9) State parallelogram law of vector addition. Find the magnitude and direction of the resultant of two vectors inclined at an angle θ with each other. What happens when θ = 0° and 90°.
10) A railway car of mass 20 tonnes move with an initial speed of 54 km/h. On applying brakes, a constant negative acceleration of 0.3 m/s^2 is produced.
   a) What is the braking force acting on the car?
   b) In what time will it stop?
   c) What distance will be travelled by car before it finally stops?

Chemistry Holiday Assignment

Note: 1.Assignment is to be done on comment sheets

2. Learn the valencies of positive and negative (monotomic and polyatomic) ions. also learn how to write the chemical formula of various compounds.

3.. Learn the confirmatory test to be performed in the lab of various positive and negative ions

Chapter -Some basic concepts of chemistry

Q1. Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, mark the correct option out of the following statements.

Students	Readings	
	(i)	(ii)
A	3.01	2.99
B	3.05	2.95

Results of both the students are neither accurate nor precise.
(b) Results of student A are both precise and accurate.
(c) Results of student B are neither precise nor accurate.
(d) Results of student B are both precise and accurate.

2. A measured temperature on Fahrenheit scale is 200°F. What will this reading be on Celsius scale?
(a) 40°C
(b) 94°C
(c) 93.3°C
(d) 30°C

3. What will be the molarity of a solution, which contains 5.85 g of NaCl(s) per 500 mL?

(a) 4 mol L-1
(b) 20 mol L-1
(c) 0.2 mol L-1
(d) 2 mol L -1

4. If 500 mL of a 5 M solution is diluted to 1500 mL, what will be the molarity of the solution obtained?
(a) 1.5 M
(b) 1.6 M
(c) 0.017 M
(d) 1.59 M

5. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following elements contains the greatest number of atoms?
(a) 4gHe (b) 46gNa (c) 0.40 gCa (d) 12 g He

6. If the concentration of glucose ($C_6H_12O_6$) in blood is 0.9 g L-1, what will be the molarity of glucose in blood?
(a) 5 M
(b) 50 M
(c) 0.005 M
(d) 0.5 M

7. What will be the molality of the solution containing 18.25 g of HCl gas in 500 g of water?
(a) 0.1 m (b) 1 M (c) 0.5 m (d) 1 m

8. One mole of any substance contains 6.022 x 1023 atoms/molecules. Number of molecules of H2S04 present in 100 mL of 0.02 M H2S04 solution is _____
(a)12.044 x 1020 molecules
(b) 6.022 x 1023 molecules
(c) 1 x 1023 molecules
(d) 12.044 x 1023 molecules

9. What is the mass per cent of carbon in carbon dioxide?
(a) 0.034%
(b) 27.27%
(c) 3.4%
(d) 28.7%

10. The empirical formula and molecular mass of a compound are CH_2O and 180g respectively. What will be the molecular formula of the compound?
(a) $C_9H_{18}O_9$,
(b) CH_2O
(c) $C_6H_{12}O_6$
(d) $C_2H_4O_2$

11. If the density of a solution is 3.12 g mL1, the mass of 1.5 mL solution in significant figures is_____

(a) 4.7 g
(b) 4680 x 10-3 g
(c) 4.680 g
(d) 46.80 g

12. Which of the following statements about a compound is incorrect?
(a) A molecule of a compound has atoms of different elements.
(b) A compound cannot be separated into its constituent elements by physical methods of separation.
(c) A compound retains the physical properties of its constituent elements.
(d) The ratio of atoms of different elements in a compound is fixed.

13. Which of the following statements is correct about the reaction given below?
$4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(s)$

(a) Total mass of iron and oxygen in reactants = total mass of iron and oxygen in product, therefore it follows law of conservation of mass.
(b) Total mass of reactants = total mass of product; therefore, law of multiple proportions is followed.
(c) Amount of Fe_2O_3 can be increased by taking any one of the reactants (iron or oxygen) in excess.
(d) Amount of Fe_2O_3 produced will decrease if the amount of any one of the reactants (iron or oxygen) is taken in excess.

14. Which of the following reactions is not correct according to the law of conservation of mass?
(a) $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$
(b) $C_3H_8(g) + O_2(g) \rightarrow CO_2(g) + H_2O(g)$
(c) $P_4(s) + 5O_2(g) \rightarrow P_4O_{10}(s)$
(d) $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$

15. Which of the following statements indicates that law of multiple proportions is being followed?
(a) Sample of carbon dioxide taken from any source will always have carbon and oxygen in the ratio 1:2.
(b) Carbon forms two oxides namely CO_2 and CO, where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2:1.
(c) When magnesium bums in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed.
(d) At constant temperature and pressure 200 mL of hydrogen will combine with 100 mL oxygen to produce 200 mL of water vapour.

$2O(g)$

Short Answer Type Questions

Q1. What will be the mass of one atom of C-12 in grams**?**

Q2. What is the symbol for SI unit of mole? How is the mole defined?

Q3. What is the difference between molality and molarity?

Q4 If 4 g of NaOH dissolves in 36 g of H20, calculate the mole fraction of each component in the solution. Also, determine the molarity of solution (specific gravity of solution is 1 g mL-1).

Q5 If 700 mL of H2 at STP contains x molecules of it, how many molecules of O2 are present in 700 mL of it at the same temperature and pressure?

Q6nitrogen combines with dihydrogen according to the reaction.

$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$
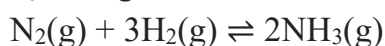
What is the ratio in their volumes under similar conditions of temperature and pressure?

Q7 nitrogen combines with dihydrogen according to the reaction.

$N_{2(g)} + 3H_2(g) \rightleftharpoons 2NH_3(g)$
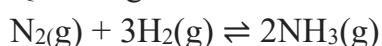
What is the ratio in their volumes under similar conditions of temperature and pressure?

Q8 What is the mass in gms of 11.2 L of N2 at STP?

Q9 What is the mass of one molecule of sodium chloride?

Q10 How many total electrons are present in 1.4 g of nitrogen gas?

Q11. How many molecules of cane sugar ($C_{12}H_{22}O_{11}$) are present in 34.20 grams of it.

Q12Calculate the mass of 0.1 moles of KNO_3.
[At. wt. of K = 39, N = 14, O = 16]

Q13. What is the molarity of a solution of oxalic acid containing 0.63 g of it in 250 cm3 of the solution?

Q14 One volume of a gaseous compound requires 2 volumes of O2 for combustion and gives 2 volumes of CO2 and 1 volume of N2. Determine the molecular formula of the compound.

Q15 How many molecules approximately do you expect to be present in a small crystal of sugar which weighs 10 mg?

Q16 Two containers of equal capacity A1 and A2 contain 10 g of oxygen (O_2) and ozone (O_3) respectively. Which of the two will have greater no. of O-atoms and which will give greater no. of molecules?

Q17 Assuming the density of water to be 1 g/cm3, calculate the volume occupied by one molecule of water.

Q18 Why atomic masses are the average values?

Q19 Four g carbon was heated with 8 g of sulfur. How much carbon disulfide (CS2) will be formed when the reaction is complete? What will be its percentage purity?

Q20. What is the molarity of a solution of oxalic acid containing 0.63 g of it in 250 cm3 of the solution?

Numerical Problems

Question 1.
In the commercial manufacture of nitric acid, how many moles of NO2 produce 7.33 mol HN03 in the reaction
$3 NO_2(g) + H_2O(l) \rightarrow 2HNO_3(aq) + NO(g)$.
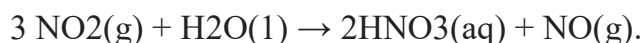
Question 2.
A sample of NaNO3 weighing 0.83 g is placed in a 50,0 mL volumetric flask. The flask is then filled with water upon the etched mark. What is the molarity of the solution?

Question 3.
Potassium bromide' KBr contains 32.9% by mass of potassium. If 6.40 g of bromine reacts with 3.60 g of potassium, calculate the number of moles of potassium that combine with bromine to form KBr.

Question 4.
Calculate the molarity of water in a sample of pure water.
Question 5.
How many molecules are there in 10.0 liters of a gas at a pressure of 75 cm at 27°C?

Question 6.
Two acids H2SO4 and H3PO4 are neutralized separately by the same amount of an alkali when sulfate and dihydrogen orthophosphate are formed respectively.

Question 7.
What weight of iodine is liberated from a solution, of potassium iodide when 1 liter of Cl2 gas at 10° C and 750 mm pressure is passed through it?

Question 8.
A crystalline salt on being rendered anhydrous loses 45.6% of its weight. The percentage composition of the anhydrous salt is Aluminium = 10.50%, Potassium = 15.1% Sulphur = 24.96%, Oxygen = 49.92%. Find the simplest formula of the anhydrous and crystalline salt.

Question 9.
An organic compound containing C, H, and O gave the following percentage composition: C = 40.687%.
H = 5.085% O = 54.228%
The vapor density of the compound is 59. Calculate the molecular formula of the compound.

Question 10.
Calculate the weight of iron which will be converted into its oxide (Fe_3O_4) by the action of 18 g of steam on it

Assertion and Reason Questions for Some Basic Concepts of Chemistry

Directions : Each of these questions contain two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

Q.1. **Assertion** : Equal moles of different substances contain same number of constituent particles.

Reason : Equal weights of different substances contain the same number of constituent particles.

Q.2. **Assertion** : 1.231 has three significant figures.

Reason : All numbers right to the decimal point are significant.

Q.3. **Assertion** : Volume of a gas is inversely proportional to the number of moles of gas.

Reason : The ratio by volume of gaseous reactants and products is in agreement with their mole ratio.

Q.4. **Assertion** : Significant figures for 0.200 is 3 whereas for 200 it is 1.

Reason : Zero at the end or right of a number are significant provided they are not on the right side of the decimal point.

Q.5. **Assertion** : One atomic mass unit is defined as one twelfth of the mass of one carbon – 12 atom.

Reason : Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.

Q.6. **Assertion** : The empirical mass of ethene is half of its molecular mass.

Reason : The empirical formula represents the simplest whole number ratio of various atoms present in a compound.

Q.7. **Assertion**: The number of O atoms in 16 g of oxygen and 16 g of ozone is same.

Reason: Each of the species represent 1 g-atom of oxygen.

Q.8. **Assertion**: 1 mole of sulphuric acid contains 32 g each of sulphur and oxygen element.

Reason: 1 mole of sulphuric acid represents 98 g of the species.

Q.9. **Assertion**: 1 mole of H_2SO_4 is neutralised by 2 moles of NaOH but 1 equivalent of H_2SO_4 is neuralised by 1 equivalent of NaOH.

Reason: Equivalent wt. of H_2SO_4 is half of its moleculer wt. while equivalent wt. of NaOH is 40.

Q.10. **Assertion:** 1 Avogram is equal to 10 amu.

Reason: Avogram is reciprocal of Avogadro number.

Q.11. **Assertion:** The ash produced by burning Mg in air is lighther than the original mass of Mg.

Reason: Mg burns in air to produce MgO_2 and Mg_3N_2.

Q.12. **Assertion**: Vapour density of sulphur vapour relative to oxygen is 2 because sulphur atom is twice as heavy as that of O atom.

Reason: Vapour density depends upon the molecular state of the substance in solid state.

Q.13. **Assertion:** Equal volumes of all the gases contain equal number of atoms.

Reason: Atom is the smallest particle which takes part in chemical reactions.

Q.14. **Assertion**: The ratio by volume of gaseous reactants and products is in agreement with their molar ratio.

Reason: Volume of a gas is inversely proportional to the number of moles of a gas.

Q.15. **Assertion**: One mole of SO2 contains double the number of molecules present in one mole of O2.

Reason: Molecular weight of SO2 is double to that of O2.

Q.16. **Assertion**: The compounds NaCl and CaO do not exists as discrete molecules.

Reason: For a substance that does not exist as discrete molecules, the formula weight and the molecular weight are identical.

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COMPUTER SCIENCE

1. Revise and Practice Class 10 and 11 Python concepts covered.
2. Complete the notebook work , Output questions (by giving proper reason for the desired output) and programs given.

   Write a menu driven program that has options to

   - accept the marks of the student in five major subjects in Class X and display the same.
   - calculate the sum of the marks of all subjects.
   - Divide the total marks by number of subjects
     (i.e. 5), calculate percentage = total marks/5 and display the percentage.
   - Find the grade of the student as per the following criteria:

Criteria	Grade
percentage > 85	A
percentage < 85 && percentage >= 75	B
percentage < 75 && percentage >= 50	C
percentage > 30 && percentage <= 50	D
percentage <30	Reappear

3. Prepare program from If - elif - else and looping statement from the Reference book and Ncert.

4. A leap year is a year that consists of 366 (not 365) days. It occurs roughly every four years. More specifically, a year is considered leap if it is either divisible by 4 but not by 100 or it is divisible by 400.

   Write a program that asks the user for a year and replies with either leap year or not a leap year.

5. Program to arrange 3 numbers in descending order using if-else.

Subject-Yoga

1.1 Yoga Etymology, Aim, objectives and misconception text.
1.2 Yoga, Origin History and development.
1.3 Rules and Regulations to be followed by Yoga practitioners.
1.4 Ashtanga Yoga

Sets

1. Decide, among the following sets, which are subsets of which.

   $A = \{x : x$ is a solution of $x^2 - 8x + 12 = 0\}$, $B = \{2, 4, 6\}$,

   $C = \{x : x$ is an even natural number$\}$, $D = \{6\}$.

2. State whether each of the following statements is true or false for the sets A and B where

   $A = \{x : x$ is a letter in the word TRACT$\}$,

   $B = \{x : x$ is a letter in the word CATARACT$\}$

      (i) $n(A) = 5$ (ii) $n(B) = 8$ (iii) $A \subset B$

      (iv) A is a proper subset of B   (v) $A = B$.

3. Let ξ = the set of all letters in the word 'TAMILNADU' and

   $X = \{x : x$ is a vowel and $x \in \xi\}$

      (i) Write ξ and X in the roster form.

      (ii) Tell $n(\xi)$ and $n(X)$.

      (iii) List all the proper subsets of X.

      (iv) What is the cardinal number of the power set of X?

4. Let A be the set of letters in the word "POOR". Write the power set of A.

5. Find the power sets of the following sets:

      (i) $\{-1, 0, 1\}$ (ii) $\{0, 1, \{0, 1\}\}$.

6. If $A = \{2, 3, 5, 7, 8\}$, $B = \{1, 5, 9\}$ and $A' = \{1, 4, 6, 9\}$, verify that

      (i) $(A \cup B)' = A' \cap B'$ (ii) $B - A = A' \cap B$.

7. For all sets A, B and C, is $A - (B - C) = (A - B) - C$ true? Justify your answer.   (Exemplar)

8. If $n(\xi) = 30$, $n(A') = 15$, $n(B) = 5$ and $n(A \cap B) = 3$, find

      (i) $n(A)$ (ii) $n(A \cup B)$ (iii) $n(A - B)$.

9. If $n(\xi) = 40$, $n((A \cup B)') = 12$, $n(A - B) = 10$ and $n(B - A) = 14$, find

      (i) $n(A)$ (ii) $n(B)$ (iii) $n(A \cap B)$.

10. Two sets A and B are such that $n(A \cup B) = 18$, $n(A' \cap B) = 3$ and $n(A \cap B') = 5$, find $n(A \cap B)$.

11. Two sets A and B are such that $n(A \cup B) = 21$, $n(A' \cap B') = 9$ and $n(A \cap B) = 7$, find $n((A \cap B)')$.

12. If $n(\xi) = 50$, $n(A) = 3x$, $n(B) = 2x$ and $n(A \cap B) = x = n((A \cup B)')$, find

      (i) the value of x (ii) $n(A - B)$.

13. If $n(\xi) = 15$, A and B are two sets such that $A \subset B$, $n(A) = 8$ and $n(B) = 12$, use Venn diagram to find the following:

      (i) $n(A')$ (ii) $n(B')$ (iii) $n(A \cap B')$ (iv) $n(A' \cap B)$.

Sets

14. In a survey of 400 students in a school, 100 were listed as drinking coffee, 150 as drinking tea and 75 were listed both coffee as well as tea. Find how many students were drinking neither coffee nor tea.

15. In an examination, 56 percent of the candidates failed in English and 48 percent failed in Science. If 18 percent failed in both English and Science, find the percentage of those who passed in both the subjects.

16. From amongst the 6000 literate individuals of a city, 50% read newspaper A, 45% read newspaper B and 25% read neither A nor B. How many individuals read both the newspapers A as well as B?

17. In a beauty contest, half the number of judges voted for Miss A, $\frac{2}{3}$ of them voted for Miss B, 10 voted for both and 6 did not vote for either Miss A or Miss B. Find how many judges, in all, were present there.

18. In a group of 50 students, the number of students studying French, English and Sanskrit were found to be as follows:

    French = 17, English = 13, Sanskrit = 15;

    French and English = 9, English and Sanskrit = 4, French and Sanskrit = 5;

    English, French and Sanskrit = 3.

    Find the number of students who study:

    (i) French only
    (ii) French and Sanskrit but not English
    (iii) English only
    (iv) French and English but not Sanskrit
    . (v) Sanskrit only
    (vi) English and Sanskrit but not French
    (vii) atleast one of the three languages
    (viii) none of the three languages.   (Exemplar)

19. If A and B are two sets such that $n(A) = 10$ and $n(B) = 7$, then find:

    (i) the least value of $n(A \cap B)$
    (ii) the greatest value of $n(A \cap B)$
    (iii) the greatest value of $n(A \cup B)$
    (iv) the least value of $n(A \cup B)$.

Relations and Functions

1. If f and g are real functions defined by $f(x) = x^2 + 7$ and $g(x) = 3x + 5$, then find the values of

   (i) $f(3) + g(-5)$ (ii) $f(-2) + g(-1)$ (iii) $f\left(\frac{1}{2}\right) \times g(14)$

   (iv) $f(t) - f(-2)$ (v) $\frac{f(t) - f(5)}{t - 5}, t \neq 5$

   (Exemplar)

2. If $f(x) = e^x$ and $g(x) = \log x$, then find:

   (i) $(f - g)(1)$ (ii) $(fg)(1)$ (iii) $\left(\frac{f}{g}\right)(3)$

3. If f and g are two real valued functions defined by $f(x) = 2x + 1$ and $g(x) = x^2 + 1$, then find the following functions:

   (i) $f + g$ (ii) $f - g$ (iii) fg (iv) $\frac{f}{g}$

   (Exemplar)

4. If $f(x) = x^3 + 1$ and $g(x) = x + 1$ be two real functions, then find the following functions:

   (i) $f + g$ (ii) $g - f$ (iii) fg (iv) $\frac{f}{g}$ (v) $2g^2 - 3f$.

5. If $f(x) = \sqrt{x - 2}$ and $g(x) = \sqrt{x^2 - 1}$ be two real valued functions, then find the following functions:

   (i) $f + g$ (ii) $g - f$ (iii) fg (iv) $3f - 2g$

   (v) $\frac{f}{g}$ (vi) $2f^2 + \sqrt{3}g$ (vii) $\frac{1}{f}$ (viii) $\frac{g}{f}$.

6. If $f(x) = x^3 - \frac{1}{x^3}$, prove that $f(x) + f\left(\frac{1}{x}\right) = 0$.   (Exemplar)

7. If $f(x) = x + \frac{1}{x}$, prove that $(f(x))^3 = f(x^3) + 3f\left(\frac{1}{x}\right)$.

8. If $y = f(x) = \frac{6x - 5}{5x - 6}$, prove that $f(y) = x, x \neq \frac{6}{5}$.

Relations and Functions

1. If $A = \{1, 2, 3\}$, $B = \{4, 5\}$ and $C = \{5, 6\}$, then verify that
   - (i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$
   - (ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$
   - (iii) $A \times (B - C) = (A \times B) - (A \times C)$.

2. Let $A = \{2, 4, 6, 8\}$ and $B = \{0, 6, 8, 9, 10\}$. Find the elements of $(A \cap B) \times (A - B)$ corresponding to the relation 'is a multiple of'.

3. Let $A = \{6, 7, 8, 10\}$, $B = \{2, 4, 5\}$, $a \in A$, $b \in B$ and R be the relation from A to B defined by $a \, R \, b$ if and only if a is divisible by b. Write R in the roster form.

4. Let $R = \{(x, y); x + 2y < 6, x, y \in N\}$
   - (i) Find the domain and the range of R
   - (ii) Write R as a set of ordered pairs.

5. Let $R = \{(x, y); y = x + 1$ and $y \in \{0, 1, 2, 3, 4, 5\}\}$.
   - (i) List the elements of R.
   - (ii) Represent R by an arrow diagram.

6. Let f be the subset of $Q \times Z$ defined by $f = \left\{ \left(\dfrac{m}{n}, \, m \right) : m, n \in Z, n \neq 0 \right\}$. Is f a function from Q to Z? Justify your answer.

7. Let $f : X \to Y$ be defined by $f(x) = x^2$ for all $x \in X$ where $X = \{-2, -1, 0, 1, 2, 3\}$ and $Y = \{0, 1, 4, 7, 9, 10\}$.

   Write the relation f in the roster form. Is f a function?

8. Is $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ a function? If this is described by the relation $g(x) = \alpha x + \beta$, then what values should be assigned to α and β. **(Exemplar)**

9. Determine a quadratic function 'f' defined by
   $$f(x) = ax^2 + bx + c \text{ if } f(0) = 6, f(2) = 11 \text{ and } f(-3) = 6.$$

10. Find the domain and the range of the function $f(x) = 2 - 3x^2$. Also find $f(-2)$ and the numbers which are associated with the number -25 in its range.

11. Find the domain and the range of the following functions:
    - (i) $\sqrt{x - 3}$
    - (ii) $\sqrt{25 - x^2}$
    - (iii) $5 - |x + 1|$.

12. Draw the graph of the function $f(x) = \begin{cases} 1 + 2x, & x < 0 \\ 3 + 5x, & x \geq 0 \end{cases}$.
    Hence, find its range.

13. If $f(x) = 2x + 5$ and $g(x) = x^2 - 1$ are two real valued functions, find the following functions:
    - (i) $f + g$
    - (ii) $f - g$
    - (iii) fg
    - (iv) $\dfrac{f}{g}$
    - (v) $\dfrac{g}{f}$
    - (vi) $3g + 2f^2$.

Trigonometry

1. Find the value of $\tan 1° \tan 2° \tan 3° \ldots \tan 89°$.

2. If $\tan \theta = 3$ and θ lies in the third quadrant, then find the value of $\sin \theta$.

3. Write $\tan\left(\dfrac{3\pi}{2} + \theta\right)$ in terms of θ.

4. Range of secant function is $R - (-1, 1)$. State true or false.

5. Find the value of $\sin\left(\dfrac{-11\pi}{3}\right)$.

6. Find the value of $\cot\left(\dfrac{-15\pi}{4}\right)$.

7. Find the value of $\cos 210°$.

8. Find the value of $\tan(-1125°)$.   **[DoE]**

Section A

9. Find the value of $\sin\dfrac{5\pi}{3}$.

10. Prove that

    $\tan 225° \cdot \cot 405° + \tan 765° \cdot \cot 675° = 0$.

11. Prove that

    $$2 \sin^2 \dfrac{3\pi}{4} + 2 \cos^2 \dfrac{\pi}{4} + 2 \sec^2 \dfrac{\pi}{3} = 10$$

12. Simplify

    $$\dfrac{\tan(90° - \theta)\sec(180° - \theta)\sin(-\theta)}{\sin(180° + \theta)\cot(360° - \theta)\csc(90° - \theta)}.$$

13. Find x from the equation: $\csc(90° + A) + x \cos A \cot(90° + A) = \sin(90° + A)$.

14. Prove that $\dfrac{\sin 225° - \cos 120°}{\sin 225° + \cos 120°} = (3 - 2\sqrt{2})$.