

SAINIK SCHOOL BHUBANESWAR
SUMMER VACATION TASK FOR THE SESSION 2024-25
SUBJECT : MATHEMATICS
CLASS – XII

RELATIONS AND FUNCTIONS

GIST OF THE LESSON

1. If $A \neq \emptyset$ and $B \neq \emptyset$ then $A \times B = \{(a, b) : a \in A \text{ and } b \in B\}$ is called Cartesian Product of sets A and B. the element (a, b) is called ordered pair
2. $A = \emptyset$ or $B = \emptyset$ then $A \times B = \emptyset$
3. $n(A \times B) = n(A) \times n(B)$
4. If $A \neq \emptyset$ and $B \neq \emptyset$ then a set R is said to be a relation from A to B if $R \subset A \times B$
5. Number of relations that can be defined from A to B is $2^{n(A) \times n(B)}$
6. Let $A \neq \emptyset$ then a set R is a relation on A if $R \subset A \times A$
7. Notation aRb is same as $(a, b) \in R$
8. $\emptyset \subset A \times A$ is a relation on A known as empty relation or void relation or null relation
9. $A \times A \subset A \times A$ is a relation on A known as universal relation on A
10. If $R = \{(a, a) : a \in A\}$ known as identity relation on A
11. R is a reflexive relation on A if $(a, a) \in R$ for every $a \in A$ or R is a reflexive relation on A if aRa for every $a \in A$
12. R is a symmetric relation on A if $(a, b) \in R \Rightarrow (b, a) \in R$ for every $a, b \in A$ Or R is a symmetric relation on A if $aRb \Rightarrow bRa$ for every $a, b \in A$
13. R is transitive on A if $(a, b) \in R$ and $(b, c) \in R \Rightarrow (a, c) \in R$ for every $a, b, c \in A$ or R is transitive on A if aRb and $bRc \Rightarrow aRc$ for every $a, b, c \in A$
14. R is an equivalence relation on A if it is reflexive, symmetric and transitive
15. If R is an equivalence relation on A and $a \in A$ then equivalence class of a, $[a] = \{b \in A : (b, a) \in R\}$
16. Sets $A_1, A_2, A_3 \dots A_n$ is a partition of set A if $A_i \cap A_j = \emptyset$ if $i \neq j$ and $A_1 \cup A_2 \cup A_3 \cup \dots \cup A_n = A$
17. Equivalence relation defined on a set gives a partition of the set as equivalence classes and every partition of set gives an equivalence relation
18. If $A \neq \emptyset$ and $B \neq \emptyset$, a function $f: A \rightarrow B$ is a relation which associate each element of A to a Unique element of B, A is known as domain of f, B is known as co domain of f
19. If $f(a) = b$ then b is known as image of a and a is known as pre-image of b
20. Set of all images of elements of A is known as range of f, Range of $f \subset B$
21. A function $f: A \rightarrow B$ is one to one or injective if $a \neq b \Rightarrow f(a) \neq f(b) \forall a, b \in A$ or $f: A \rightarrow B$ is one to one or injective if $f(a) = f(b) \Rightarrow a = b \forall a, b \in A$
22. A function which is not one to one is known as many to one
23. A function $f: A \rightarrow B$ is onto or surjective if for each element $b \in B$, there exists $a \in A$ such that $f(a) = b$
24. A function $f: A \rightarrow B$ is onto or surjective if Range of $f = B$
25. A function $f: A \rightarrow B$ which is not onto is known as into function
26. A function $f: A \rightarrow B$ which is both one to one and onto is known as a bijection
27. A function $f: A \rightarrow B$ which is both injective and surjective is known as a bijection
28. If $n(A) = m$ and $n(B) = n$ then Number of functions that can be defined from A to B $= n^m$
29. For a finite set A, if a function $f: A \rightarrow A$ is one to one then f is onto
30. For a finite set A, if a function $f: A \rightarrow A$ is onto then f is one to one
31. For a finite set A the number of bijection from A to A = number of onto functions from A to A = number of one to one function from A to A = $n!$
32. Graphical test for a function: if any straight line parallel to y axis does not cut the graph at more than one point then the graph represents a function
33. Graphical test for one-to-one function: if any straight line parallel to x axis does not cut the graph at more than one point then the graph represents a one-to-one function
34. A function $f: A \rightarrow B$ is invertible if and only if it is a bijection.

SAINIK SCHOOL BHUBANESWAR
SUMMER VACATION TASK FOR THE SESSION 2024-25
SUBJECT : MATHEMATICS
CLASS – XII

Instructions :

- Solve the questions in Separate Maths Note Book.
 - Utilize the available time to solve the Chapters (Class XI) from NDA Pathfinder as your preparations towards NDA.
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1. During a Swachh Bharat Abhiyan organizing committee wanted collect and segregate Metal, Paper, glass, batteries, organic and plastic waste. In the set of all participants a relation R defined as $R = \{(x, y) \in R: \text{both the participants } x \text{ and } y \text{ collect the same type of waste}\}$ Based on the information given above answer the following questions (a) Check whether R is an Equivalence relation in the set of all participants (b) In how many groups the participants are divided on the basis of their waste collection assume that there are participants to collect all type of waste (c) State whether the waste collected from different groups are segregated or not?
2. Farmers plant sapling along straight lines parallel to each other as in figure .Let us assume that saplings are planted along the line $y=x+1$ and parallel to it. Let L be the set of all lines on the field Answer the following using the above information (i) R_1 be a relation defined on L as $R_1 = \{(l_1, l_2): l_1 \parallel l_2, \text{ where } l_1, l_2 \in L\}$ then R_1 is (ii) Which of the following line is related the line $y=x+1$ as per definition of the relation R_1 (a) $2x-y+5=0$ (b) $2x+y=5$ (c) $2x-2y=10$ (d) $x+y=1$ (iii) R_2 be a relation defined on L as $R_2 = \{(l_1, l_2): l_1 \perp l_2, \text{ where } l_1, l_2 \in L\}$ then R_2 is (a) symmetric but neither reflexive nor transitive (b) reflexive and symmetric but not transitive (c) reflexive but neither symmetric nor transitive (d) R is an equivalence relation (iv) The function $f: R \rightarrow R$ defined by $f(x) = x+1$ is (a) Injective but not surjective (b) Surjective but not injective (c) Bijective (d) Neither Injective Not Surjective (v) Let function $f: R \rightarrow R$ defined by $f(x) = x+1$ then range of is (a) Q (b) Z (c) W (d) R
3. In a Master chef competition final round 3 chef were selected and Judges assigned three dishes $D = \{D_1, D_2, D_3\}$ to the participants $P = \{P_1, P_2, P_3, \}$ and asked them to prepare dishes as per the following rules. Rule A: everybody has to prepare exactly one dish Rule B: No two participant is allowed to prepare same dish Rule C: All the dish must be prepared in the competition Answer the following questions in the context of functions (a) In how many ways all participants can choose a Dish as per rule A? Justify your answer (b) In how many ways everybody can choose a dish to prepare as per Rule B? Justify your answer (c) In How many ways all participants can prepare exactly one dish as per rule C, Justify your answer
4. Check whether the relation R on the set N of natural numbers given by $R = \{(a, b): b \text{ is a multiple of } a\}$ is reflexive, symmetric and transitive
5. Let W denote the set of words in English dictionary. Define the relation R by $R = \{(x, y): x, y \in W \text{ such that } x \text{ and } y \text{ have at least one letter in common}\}$. Show that this relation R is reflexive and symmetric but not transitive
6. An equivalence relation R in the set A divides it into equivalence classes A_1, A_2, A_3 Find (i) $A_1 \cup A_2 \cup A_3$ (ii) $A_1 \cap A_2 \cap A_3$
7. Check whether the relation R on set of all real numbers R as $R = \{(a, b): a \leq b^3\}$ is reflexive, symmetric and transitive
8. Let R be a relation defined on the set of natural numbers N as $R = \{(x, y): x, y \in N, 2x+y=11\}$. Verify whether R is reflexive, symmetric and transitive
9. If $F = \{(1,2), (2,4), (3,1), (4, k)\}$ is a one -to-one function from set A to A , where $A = \{1,2,3,4\}$ then find the value of k , also find the number of bijections can defined from A to A

10. A relation f defined in the set of real numbers R as $f = \{(a, b) : \forall a = b\}$ Verify whether f is a function from R to R .

11. Show that the function $f: R \rightarrow R$ given by $f(x) = 4x^3 + 7$ is a bijection

12. Let $F: [2, \infty) \rightarrow B$ be a function defined as $F(x) = 5 - 4x + x^2$ is a bijection then find B

13. Let $f: R - \{-4/3\} \rightarrow R - \{4/3\}$ given by $f(x) = \frac{4x+3}{3x+4}$ Show that f is a bijective function

LONG ANSWER QUESTIONS

14. Show that the relation on the set $A = \{x \in Z : 0 \leq x \leq 12\}$ given by $R = \{(a, b) : |a - b| \text{ is divisible by } 4\}$ is an equivalence relation Find all elements related to 1, equivalence class $[1]$

15. Prove that the relation R in the set Z of integers defined as $R = \{(a, b) : a + b \text{ is divisible by } 2\}$ is an equivalence relation. Write the equivalence class $[0]$

16. Let N be the set of natural numbers and R be the relation on $N \times N$ defined by $(a, b) R (c, d)$ if and only if $ad = bc$ for all $a, b, c, d \in N$. Show that R is an equivalence relation

17. Let $A = \{1, 2, 3, \dots, 9\}$ and R be the relation on $A \times A$ defined as $(a, b) R (c, d)$ if and only if $a + d = b + c$. Prove that R is an equivalence relation also obtain the equivalence class $[(2, 5)]$

18. Let R be the relation on $N \times N$ defined by $(a, b) R (c, d)$ if and only if $ad + (b + c) = bc + (a + d)$, Prove that R is an equivalence relation

19. Show that the relation R defined on the set $N \times N$ defined as $(a, b) R (c, d)$ if and only if $a^2 + d^2 = b^2 + c^2$ is an equivalence relation

20. Show that the function $f: R \rightarrow R$ given by $f(x) = \frac{x}{x^2 + 1}$ is neither one to one nor onto

21. Show that $f: N \rightarrow N$, given by $f(x) = x + 1$ if x is odd and $x - 1$ if x is even is a bijection

22. Show that the function $f: N \rightarrow N$ defined as $f(x) = x^2 + x + 1$ is one to one but not onto

23. Let $A = [-1, 1]$. Then, discuss whether the following functions defined on A are one-one, onto or bijective (i) $f(x) = x^2$ (ii) $g(x) = |x|$ (iii) $h(x) = x|x|$ (iv) $k(x) = x^2$.

24. The number of equivalence relations that can be defined in the set $A = \{1, 2, 3\}$ which containing the elements $(1, 2)$ is (a) 0 (b) 1 (c) 2 (d) 3

25. The number of one-to-one functions that can be defined from the set $\{1, 2, 3, 4, 5\}$ to $\{a, b\}$ is (a) 5 (b) 0 (c) 2 (d) 3

SAINIK SCHOOL BHUBANESWAR

SUMMER VACATION HOMEWORK 2024-25

CLASS-XII

BIOLOGY

1. Prepare a hand written investigatory project report (10-15) pages on any one topic given in the class.
Choose one topic and start collecting literature and relevant materials on it, submit the draft report with relevant case studies and other data after the summer vacation.
2. Complete all the questions given at the end of the chapter 2, 3 and 4 of Unit 1. Draw neat and labelled diagrams wherever necessary.
3. Write down important definitions of Chapter-2,3 & 4.
4. Revisethese lessons well for class testafter the break.
5. Prepare a list of Biologists and their contribution, who got Noble Prize in Medicine in last five years on A4 size paper.
6. Write 20 MCQ each for Chapter-2,3 & 4.
7. Draw labelled diagrams for the following:
 - a) T.S of Testis
 - b) Sectional view of human ovary
 - c) A fertilized embryo sac of a dicot flower
 - d) A typical anatropous ovule

SAINIK SCHOOL BHUBANESWAR, ODISHA
SUMMER VACATION TASK, SESSION-2024-25
CLASS –XII (CHEMISTRY)
SOLUTIONS

1. Explain why on addition of 1 mol of NaCl to 1 litre of water, the boiling point of water increases, while addition of 1 mol of methyl alcohol to one litre of water decreases its boiling point.
2. Explain the solubility rule “like dissolves like” in terms of intermolecular forces that exist in solutions.
3. Concentration terms such as mass percentage, PPM, mole fraction and molality are independent of temperature, however molarity is a function of temperature. Explain.
4. What is the significance of Henry’s Law constant K_H ?
5. Why are aquatic species more comfortable in cold water in comparison to warm water?
6. (a) Explain the following phenomena with the help of Henry’s law.
 - (i) Painful condition known as bends.
 - (ii) Feeling of weakness and discomfort in breathing at high altitude.(b) Why soda water bottle kept at room temperature fizzes on opening?
7. Why is the vapour pressure of an aqueous solution of glucose lower than that of water?
8. How does sprinkling of salt help in clearing the snow covered roads in hilly areas? Explain the phenomenon involved in the process. What is “semi permeable membrane”?
9. Why is it not possible to obtain pure ethanol by fractional distillation? What general name is given to binary mixtures which show deviation from Raoult’s law and whose components cannot be separated by fractional distillation? How many types of such mixtures are there?
10. 0.6 ml of acetic acid (CH_3COOH) having density 1.06g mL^{-1} is dissolved in 1Lt of water. The depression in F.P observed for this strength of acid was 0.0205°C . Calculate the Vant Hoff factor and dissociation constant for acid.
11. A solution prepared by dissolving 8.95mg of a gene fragment in 35.0 mL of water has an osmotic pressure of 0.335 torr at 25°C . Assuming that the gene fragment is a non-electrolyte, calculating its molar mass.
12. The reaction, $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{NO}(\text{g})$ contributes to air pollution whenever a fuel is burnt in air at a high temp. at 1500 K, equilibrium constant K for it

is 1.0×10^{-5} . Suppose in a case $[N_2] = 0.80 \text{ mol L}^{-1}$ and $[O_2] = 0.20 \text{ mol L}^{-1}$ before any reaction occurs. Calculate the equilibrium concentrations of the reactants and the products after the mixture has been heated to 1500K.

13. A solution of glucose ($C_6H_{12}O_6$) in water is labeled as 10% weight . What would be the molality of the solution? (Molar mass of glucose = 180 g mol^{-1})
14. Two elements A and B form compounds having formulae AB_2 and AB_4 when dissolved in 20g of benzene (C_6H_6). 1g of AB_2 lowers the freezing point by 2.3K whereas 10g of AB_4 lowers it by 1.3K. The molal depression constant for benzene is $5.1 \text{ K kg mole}^{-1}$. Calculate the atomic masses of A and B.
13. Calculate molality of KI solution if its density is 20% (w/w).

ELECTROCHEMISTRY

1. What does the negative sign in the expression $E^0 \text{ Zn}^{2+}/\text{Zn} = -0.76 \text{ V}$ mean?
2. Aqueous copper sulphate solution and aqueous silver nitrate solution are electrolysed by 1 ampere current for 10 minutes in separate electrolytic cells. Will the mass of copper and silver deposited on the cathode be same or different? Explain your answer.
3. Depict the galvanic cell in which the cell reaction is;
$$\text{Cu(s)} + 2\text{Ag}^+(\text{aq}) \rightarrow 2\text{Ag}^+(\text{aq}) + \text{Cu}^{2+}$$
4. Value of standard electrode potential for the oxidation of Cl^- ions is more positive than that of water, even then in the electrolysis of aqueous sodium chloride, why is Cl^- oxidised at anode instead of water?
5. What is electrode potential?
6. Why is alternating current used for measuring resistance of an electrolytic solution?
7. A galvanic cell has electrical potential of 1.1V. If an opposing potential of 1.1V is applied to this cell, what will happen to the cell reaction and current flowing through the cell?
8. How will the pH of brine (aq. NaCl solution) be affected when it is electrolysed?
9. Unlike dry cell, the mercury cell has a constant cell potential throughout its useful life. Why?
10. Solutions of two electrolytes 'A' and 'B' are diluted. The Λ_m of 'B' increases 1.5 times while that of A increases 25 times. Which of the two is a strong electrolyte and why?

11. The electrical resistance of column of 0.05M NaOH solution of diameter 1 cm & length 50 cm is $5.55 \times 10^3 \text{ohm}$. Calculate its resistivity, conductivity and molar conductivity.
12. (a) Calculate the charge in coulombs required for oxidation of two moles of water to oxygen.
 (b) A copper-silver cell is set up. The copper ion concentration is 0.10M. The concentration of silver ion is not known. The cell potential when measured was 0.422V. Determine the concentration of silver ions in the cell.
 ($E^\circ_{\text{Ag}^+/\text{Ag}}=0.80\text{V}$, $E^\circ_{\text{Cu}^{2+}/\text{Cu}}=0.34\text{V}$)
13. Two students performed two different experiments on electrolysis. Student A electrolysed 1litre of 1M aq. Solution of KMnO_4 till after reduction the final solution to 0.1M K_2MnO_4 . Student B electrolyzed NiSO_4 solution by passing 12 ampere current but the efficiency was only 60%. (Atomic mass of Ni= 58.7gmol^{-1})
- a) What is the amount of electricity used by student A?
 b) What is the amount of Ni deposited on cathode per hour in solution used by student B.

CHEMICAL KINETICS

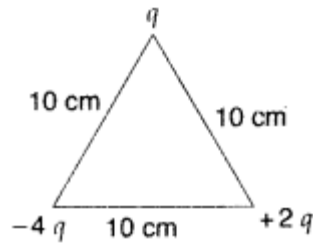
1. A reaction is second order with respect to a reactant. How is the rate of reaction affected if the concentration of the reactant is
 (a) doubled and (b) reduced to half ?
2. What is the effect of temperature on the rate constant of a reaction? How can this temperature affect on rate constant be represented quantitatively?
3. A reaction is first order in A and second order in B.
 (a) Write the differential rate equation.
 (b) How is the rate affected on increasing the concentration of B three times?
 (c) How is the rate affected when the concentrations of both A and B are doubled?
4. Calculate the half-life of a first order reaction from their rate constants given below:
 (a) 200 s^{-1} (b) 2 min^{-1} (c) 4 years^{-1}
5. The half-life for radioactive decay of ^{14}C is 5730 years. An archaeological artifact containing wood had only 80% of the ^{14}C found in a living tree. Estimate the age of the sample.
6. The rate constant for a first order reaction is 60 s^{-1} . How much time will it take to reduce the initial concentration of the reactant to its 1/16th the value?

7. During nuclear explosion, one of the products is ^{90}Sr with half-life of 28.1 years. If $1\mu\text{g}$ of ^{90}Sr was absorbed in the bones of a newly born baby instead of calcium, how much of it will remain after 10 years and 60 years if it is not lost metabolically.
8. For a first order reaction, show that time required for 99% completion is twice the time required for the completion of 90% of reaction.
9. A first order reaction takes 40 min for 30% decomposition. Calculate $t_{1/2}$.
10. The rate constant for the decomposition of hydrocarbons is $2.418 \times 10^{-5}\text{s}^{-1}$ at 546 K. If the energy of activation is 179.9 kJ/mol, what will be the value of pre-exponential factor?
11. The rate constant for the first order decomposition of H_2O_2 is given by the following equation:

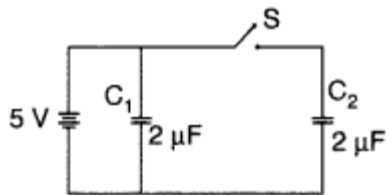
$$\log k = 14.34 - 1.25 \times 10^4 / T$$
 Calculate E_a for this reaction and at what temperature will its half-period be 256 minutes?
12. The decomposition of A into product has value of k as $4.5 \times 10^3 \text{s}^{-1}$ at 10°C and energy of activation 60 kJ mol $^{-1}$. At what temperature would k be $1.5 \times 10^4 \text{s}^{-1}$?
13. The time required for 10% completion of a first order reaction at 298K is equal to that required for its 25% completion at 308K. If the value of A is $4 \times 10^{10}\text{s}^{-1}$. Calculate k at 318K and E_a .
14. The rate of a reaction quadruples when the temperature changes from 293 K to 313 K. Calculate the energy of activation of the reaction assuming that it does not change with temperature.
15. The decomposition of hydrocarbon follows the equation $k = (4.5 \times 10^{11}\text{s}^{-1}) e^{-\frac{28000}{KT}}$. Calculate E_a .

1. Two point charges $6\ \mu\text{C}$ and $-2\ \mu\text{C}$ are separated by a distance 1m in air. Calculate at what point on the line joining the two charges is the electric field zero?
2. Calculate the amount of work done in rotating a dipole of dipole moment $3 \times 10^{-8}\ \text{Cm}$ from its position of stable equilibrium to the position of unstable equilibrium in a uniform electric field of intensity $10^4\ \text{N/C}$
3. Derive an expression for the torque experienced by an electric dipole kept in a uniformly electric field.
4. Name the physical quantity whose S.I. unit is JC^{-1} . Is it a scalar or a vector quantity?
5. Write the expression for the work done on an electric dipole of dipole moment p in turning it from its position of stable equilibrium to a position of unstable equilibrium in a uniform electric field E .
6. Draw a plot showing variation of electric field with distance from the centre of a solid conducting sphere of radius R , having a charge of $+Q$ on its surface.
7. Plot a graph showing the variation of Coulomb force (F) versus $(1/r^2)$, where r is the distance between the two charges of each pair of charges: $(1\ \mu\text{C}, 2\ \mu\text{C})$ and $(2\ \mu\text{C}, -3\ \mu\text{C})$. Interpret the graphs obtained.
8. Define electric dipole moment. Write its S.I. unit. Is it a vector or scalar?
9. Why must electrostatic field be normal to the surface at every point of a charged conductor?
10. What is the direction of the electric field at the surface of a charged conductor having charge density $\sigma < 0$?
11. Why do the electrostatic field lines not form closed loops?
12. Why do the electric field lines never cross each other?
13. A point charge $+Q$ is placed in the vicinity of a conducting surface. Draw the electric field lines between the surface and the charge.
14. Two point charges $+q$ and $-2q$ are placed at the vertices 'B' and 'C' of an equilateral triangle ABC of side L . Obtain the expression for (i) the magnitude and (ii) the direction of the resultant electric field at the vertex A due to these two charges.
15. Derive the expression for electric field at a point on the equatorial line of an electric dipole.
16. Draw the electric field lines for a system of charges $+q$ and $-q$.
17. How does the electric force vary if each charge is doubled and separation is halved for given set of charges?
18. How does the electric field vary if medium changes? Justify your answer.
19. State Gauss's law in electrostatics. Derive an expression for the electric field due to an infinitely long straight uniformly charged wire.
20. Using Gauss's law, prove that the electric field at a point due to a uniformly charged infinite plane sheet is independent of the distance from it.
21. A $500\ \mu\text{C}$ charge is at the centre of a square of side $10\ \text{cm}$. Find the work done in moving a charge of $10\ \mu\text{C}$ between two diagonally opposite points on the square.
22. Derive the expression for the electric potential at any point along the axial line of an electric dipole

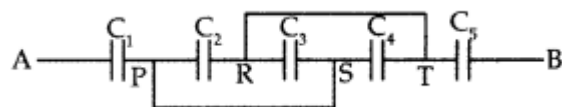
23. Calculate the work done to dissociate the system of three charges placed on the vertices of a triangle as shown.



24. Figure shows two identical capacitors C_1 and C_2 , each of $2 \mu\text{F}$ capacitance, connected to a battery of 5 V . Initially switch 'S' is left open and dielectric slabs of dielectric constant $K = 5$ are inserted to fill completely the space between the plates of the two capacitors. How will the charge and



- (ii) potential difference between the plates of the capacitors be affected after the slabs are inserted?
25. A parallel plate capacitor of capacitance C is charged to a potential V . It is then connected to another uncharged capacitor having the same capacitance. Find out the ratio of the energy stored in the combined system to that stored initially in the single capacitor.
26. A parallel plate capacitor is charged by a battery. After some time the battery is disconnected and a dielectric slab of dielectric constant K is inserted between the plates. How would
- the capacitance,
 - the electric field between the plates and
 - the energy stored in the capacitor, be affected? Justify your answer.
27. A slab of material of dielectric constant K has the same area as that of the plates of a parallel plate capacitor but has the thickness $d/2$, where d is the separation between the plates. Find out the expression for its capacitance when the slab is inserted between the plates of the capacitor.
28. (i) Find equivalent capacitance between A and B in the combination given below. Each capacitor is of $2 \mu\text{F}$ capacitance



- (ii) If a dc source of 7 V is connected across AB, how much charge is drawn from the source and what is the energy stored in the network?
29. Derive the expression for the electric potential at any point P, at distance r from the centre of an electric dipole, making angle α , with its axes.
30. Calculate the amount of work done to dissociate a system of three charges $1 \mu\text{C}$, $1 \mu\text{C}$ and $-4 \mu\text{C}$ placed on the vertices of an equilateral triangle of side 10 cm .

Sainik School Bhubaneswar
Summer Vacation Holiday Homework: 2024-2025

ENGLISH
CLASS XII

1. Why were the villagers seated on the back benches?
2. What was unusual about the school that Franz noticed when he entered the school?
3. Why was it the last lesson? How did Franz react to it?
4. What did M. Hamel say about French language?
5. Why did not M Hamel want the people to forget French?
6. Describe how M Hamel conducted the last lesson.
7. What was the mood in the classroom when M Hamel gave his last French lesson?
8. What happened when the church clock struck twelve?
9. What does the title "Lost Spring" convey?
10. Do you think Saheb was happy to work at the tea stall? Give reasons.
11. Is it possible for Mukesh to realise his dream? Justify your answer.
12. Why was not Saheb happy on getting a job?
13. Why don't the bangle makers of Firozabad organise themselves?
14. "Saheb is no longer his own master", says the writer. What does she mean?
15. What did garbage mean to the children of Seemapuri and to their parents?
16. Describe the difficulties the bangle makers of Firozabad have to face in their lives. (150 Words)
17. "It is his *karam*, his destiny" that made Mukesh's grandfather go blind. How did Mukesh disprove this belief by choosing a new vocation and making his own destiny? (150Words)
18. There is a flood of advertisements on television channels these days. Write a letter to the Editor, Indian Express about the negative influence which such advertisements have on the minds of the people. You are Sunita / Sunil of Mayur Vihar, Kanpur.
19. **You are Reshma / Raghu staying at the Press Apartments at Nagpur. The main road leading to this colony has three open manholes causing frequent accidents at night. Also it gets so dark in the evenings in winter that the children and women just cannot venture to move out alone during night time. Write a letter to the Editor of 'The Times of India' drawing attention of the government towards this problem of the residents.**
20. The new traffic rules have created a panic among people in general using two-wheelers and four-wheelers on road. Riding/driving a vehicle without proper documents such as driving license, registration, insurance, pollution certificate and without using helmet or seat belt results in imposition of heavy penalty anybody could have ever imagined. In certain cases, the ill treatment by the police also adds to the common man's woe. You are a social activist who wants to draw the attention of the concerned authorities to stop such harassment and ill treatment to people and reduce the penalty amount. Write a letter to the editor of a national daily on the issue. (120-150 words)
21. You are Vani / Vikrant Kapoor, Head of the Health & Wellness club of your school. Your club organized a seminar to make students aware about alarming use of

chemicals in Vegetables & fruits. Experts from the medical field and consumer forums were invited to answer the queries of the audience. Write a report in 150-200 words for your school magazine.

22. Your school recently celebrated the 150th Birth Anniversary of Mahatma Gandhi. The school also conducted various competitions among students and organised cultural programmes featuring Gandhi's life and work. As student reporter for your school magazine, write a report giving details of the celebrations. You are Paramesh/Paramita. (150-200 words)

23. Your school celebrated the 150th Birth Anniversary of the father of the nation, Mahatma Gandhi. Write a report in 150-200 words for your school magazine, giving details of the celebration. You are Amit / Amita of Maharani Senior Secondary School, Gwalior.

24. A recent study has revealed that teenagers who use the smart phone more than four hours a day dissociate themselves with family members and friends ultimately ending up in mental depression. Write an article for a national daily on 'The Impact of Smart Phone on Teenagers' creating awareness among them. You are Ankan / Anita.

25. Mahatma Gandhi once said, "I regard the English language as an open window for peeping into western thought and science." Write an article in 150-200 words on "The Usefulness of English Language in India ". You are Pratyush / Priya.

26. Rising pollution, fast and competitive lifestyle, lack of nutritious food etc. have caused health woes for a large section of our population. Providing healthcare used to be a charitable and ethical activity in the past but today it has become commercialised, a money spinning business. Write an article in 150-200 words on "How to provide proper healthcare to the common man". You are Rohit/ Rashmi.

27. You are Radhika /Rajeev from 21, Cherry Road, Madurai. Draft an application with a separate bio-data in about 120-150 words for the post of the librarian in Vision Senior Secondary School, Calicut. You came to know about the vacancy in the said post from a National newspaper.

28. You are an NCC Officer of K.V. Mysore. You have decided to send a troop of NCC of your school to the National Integration Camp to be held at Lucknow for a week. Draft a notice in not more than 50 words to be placed on the school notice board inviting the names of those Cadets who are interested to participate in the Camp. Invent the necessary details.

29. Due to a sudden landslide and unfavourable weather, Navodaya Vidyalaya Shimla has to be closed for a week. As the Principal of that school, draft a notice in not more than 50 words to be displayed at the school main gate notice board.

30. You are Secretary of Lions Club, Madurai. Write a notice in not more than 50 words informing the members to attend an extraordinary meeting of the governing body. Include details like date, time venue, etc.

Sainik School Bhubaneswar
Summer Vacation Task
Session 2024 - 25
Class - XII
Subject - Computer Science

Q1. Out of the following, find those identifiers, which can be used for naming variables or functions in a Python program:

3.14*r,global,While,do,1stNumber,sum,Add12,_Input

Q2. Find the invalid operators from the following:

***,<>,%,+=-,-

Q3. What is an expression and a statement?

Q4. Write the type of tokens from the following:

If , Roll_no, &, ()

Q5. What are variables? How are they important?

Q6. What are operators? Give examples of some unary and binary operators.

Q7. What is expression?

Q8. Predict the output of the following code snippets:

(i) for ch in "light":

```
    print(str.upper(ch))
```

(ii) a=20

b=10

```
for x in range(a-b*2):
```

```
    print("@",x)
```

(iii) QUAD= "USA#JAPAN#INDIA#AUSTRALIA"

```
Y=QUAD.split("#")
```

```
for z in Y:
```

```
    if z<'M':
```

```
        print(str.lower(z))
```

```
    else:
```

```
        print(str.upper(z))
```

Q9. What is entry controlled loop? Give example.

Q10. What are mutable and immutable data types? List out the both in separate columns.

Q11. What is type casting? How can a programmer do implicit conversion?

Q12. Describe the concept of block and body. How indentation is related to block and body?

Q13. Write Python statement for the following in interactive mode:

(a) To display sum of 3, 8.0, 6*12

(b) To print sum of 16, 5.0, 44.0.

Q14.. What all components can a Python program contain?

Q15. Write the output of the following:

(i) for i in '123' :

```
    print ("guru99",i,)
```

(ii) for i in [100, 200, 300]

```
    print (i)
```

(iii) for j in range (10, 6,-2) :

```
    print(j*2)
```

(iv) for x in range (1,6) :

```
    for y in range (1,x+1) :
```

```
        print(x, ' ',y)
```

(v) for x in range (10, 20):

```
    if (x == 15) :
```

```
        break
```

```
    print (x)
```

(vi) for x in range (10,20):

```
    if (x%2 == 0):
```

```
        continue
```

```
    print (x)
```

Q16. Write the output of the following program on execution if x = 50:

```
if x>10:
```

```
    if x>25:
```

```
        print("OK")
```

```
    if x>60:
```

```
        print ("GOOD")
```

```
elif x>40:
```

```
    print ("AVERAGE")
```

```
else:
```

```
    print("NO,OUTPUT")
```

Q17. What are the various ways of creating a list?

Q18. What are the similarities between strings and lists?

Q19. Why lists are called mutable data type?

Q20. What is the difference between insert () and append () methods of a list?

Q21. Write a program to calculate the mean of a given list of numbers.

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