

RADIANT CENTRAL CHILDREN ACADEMY
SUMMER VACATION HOMEWORK 23-24
CLASS XI
ENGLISH CORE

Note: Students are being instructed to do Home work in Your Class Note books.

Days	No	Question	
Day-1	1	As Mukul / Mahima of Alps Public School, write a speech to be delivered in school assembly highlighting the importance of cleanliness suggesting that the state of cleanliness reflects the character of its citizens. (150-words)	5
Day -2	2	Manish has to speak in debate supporting the motion that life in the country (a village) is preferable to life in the city. Below you can see his notes. Use the information to develop Manish's speech in 150- words. COUNTRY (A VILLAGE) peace and quiet—soothing air—fresh and pure green fields all around—lovely sight helpful neighbours CITY-vehicles—smoke industries—smoke-pollution crowded streetspeople hurry—never relax	5
Day -3	3	You have to speak in the school's morning assembly on 'The Harm that Mobile Phones and Smartphones are Creating in Students' Lives'. Write the speech in 150-words. You are Javed/Jyotsana of class XI	5
Day -4	4	Q1-You are Krishna/ Tisha, Secretary, Greenland Enterprises Ltd, Delhi-110006. Your Chairman has asked you to draft an advertisement for a local daily under the classified columns for the vacant posts of one accountant and two office assistants. Draft an advertisement Q-2You are the Managing Director of Varun Enterprises, a leading garments export house. You need accountants for your Meerut office. Write an advertisement for the 'Situation Vacant' column of a local daily	3 + 3
Day -5	5	Q1-You are Shirish Saxena of 47, Mall Road, Shimla. You are a young man of 35 with seven years of experience as an expert executive. You seek an immediate change to some prestigious export house in Mumbai /Bangalore. Draft a suitable advertisement for the 'Situation Wanted' column of a National Daily. Q2-You are AP Raman of 22/14 Arabi Tank Lane, Trichy, Tamil Nadu. Your grandmother, Chennamo is missing from your home for the last 5 days. Draft a suitable advertisement with all details to be published in a local daily in the classified column.	3 + 3
Day -6	6	Write an article or Poem or Travelogue Of your choice for school Magazine	
Day -7	7	Read the chapter "The Summer of the beautiful white horse" and write the value points of the read chapter.	5
Day -8	8	Write the character sketch of Mourad on the basis of the chapter "The Summer of the beautiful white horse" in about 120 words	5
Day -9	9	Read the chapter "Discovering Tut :The Saga continues" and write the value points of the read chapter.	5
Day-10	10	Rearrange the following jumbled words/phrases to make meaningful sentences (a) inside/grandeur/the palace hall/it was/all (b) interwoven/pearls/were/flower garlands/sparkling/with (c) wooden stage/painted backcloth/the/decorated/with a/was (d) killed/they are/beaten/chained/and/mercilessly/trained. (e) their/heed/but/hears/and/pays/nobody/to/cries (f) friends/auxiliaries/animals/necessary/are our/and/survival/for our (g) animal/matters/our vision/a world/should be/where/welfare (h)Extremely/a/grief/it/is/that matter/unkindly/animals/are/of exploited	4 + 3
		Q2-Fill in the blanks on the basis of tense: 1.Janet __ karate class every Saturday. (attend) 2.The market __ usually noisy in the morning. (to be) 3.The delivery man __ the parcel already. (delivery) 4.The athletes __ for Canada tomorrow. (leave) 5.Aida __ her room for the past hour. (paint) 6.The breadman __ to our housing estate every evening. (come) 7.Warren __ badminton since primary school. (play) 8.The meeting __ due to lack of quorum. (postpone) 9.You are late. The bus __ already. (leave) 10.Everyone __ about Lin Dan's achievement in the Beijing Olympics. (talk)	

ग्रीष्मावकाश गृहकार्य (हिंदी)

कक्षा - 11

DAY -1

1. किसी एक महत्वपूर्ण दिवस या अवसर का उल्लेख करते हुए डायरी लिखिए ।
2. विद्यालय पत्रिका हेतु कोई स्वरचित कहानी , कविता , यात्रा या अनुभव लेख तैयार करें ।

DAY -2

3. सामाजिक, राजनैतिक या सांस्कृतिक क्षेत्र से सम्बन्धित किसी व्यक्ति विशेष का साक्षात्कार तैयार कीजिए ।

DAY - 3

4. आपदाग्रस्त क्षेत्रों में भारतीय सेना के द्वारा किए जाने वाले सहायक कार्यों का वर्णन करते हुए किसी समाचार पत्र के संपादक को पत्र लिखिए ।
5. गंदगी द्वारा फैलने वाले रोगों का नामोल्लेख करते हुए इनकी रोकथाम हेतु स्वास्थ्य विभाग उत्तर प्रदेश राज्य सरकार द्वारा भारत सरकार को पत्र लिखिए ।

DAY- 4 & 5

6. हाल ही में पठित किसी पुस्तक की समीक्षा प्रस्तुत कीजिए।

DAY -6

7. अपने किसी प्रिय साहित्यकार का सम्पूर्ण जीवन परिचय लिखिए ।
8. स्वतंत्रता के 75 वें अमृत महोत्सव के अवसर पर किसी गुमनाम स्वतंत्रता संग्राम सेनानी पर आलेख तैयार करिए ।

DAY -7,8,9

9. अधोलिखित कहानियों पर समीक्षात्मक टिप्पणी लिखिए -
क. ईदगाह ख. आकाशदीप ग. पूस की रात

DAY -10

10. किन्हीं दो विषयों पर रचनात्मक लेख तैयार कीजिए -
क. वैश्विक पटल पर भारत की नई छवि ख. परीक्षा का वह दिन
ग. पुस्तकालय ज्ञान का साधन घ. मेरा प्रिय टाइम पास

मूल्यांकन का आधार -

विषयवस्तु - 5 अंक

भाषा एवं प्रस्तुति - 3 अंक

शोध एवं मौलिकता - 2 अंक

PHYSICS

XI

UNITS AND MEASUREMENTS

Day- 1

- 1 Consider a simple pendulum, having a bob attached to a string, that oscillates under the action of the force of gravity. Suppose that the period of oscillation of the simple pendulum depends on its length (l), mass of the bob (m) and acceleration due to gravity (g). Derive the expression for its time period using method of dimensions. 3
- 2 The length, breadth and thickness of a rectangular sheet of metal are 4.234 m, 1.005 m, and 2.01 cm respectively. Give the area and volume of the sheet to correct significant figures. 2
- 3 Convert one joule into erg using by dimension method. 2
- 4 Convert one newton into dyne using by dimension method 2
- 5 Which of the following is the most precise device for measuring length? 3
 - (a) a vernier callipers with 20 divisions on the sliding scale
 - (b) a screw gauge of pitch 1 mm and 100 divisions on the circular scale
 - (c) an optical instrument that can measure length to within a wavelength of light?

Day-2

- 1 The mass of a box measured by a grocer's balance is 2.300 kg. Two gold pieces of masses 20.15 g and 20.17 g are added to the box. What is (a) the total mass of the box, (b) the difference in the masses of the pieces to correct significant figures ? 3
- 2 Explain this statement clearly : "To call a dimensional quantity 'large' or 'small' is meaningless without specifying a standard for comparison". In view of this, reframe the following statements wherever necessary : 3
 - (a) atoms are very small objects
 - (b) a jet plane moves with great speed
 - (c) the mass of Jupiter is very large
 - (d) the air inside this room contains a large number of molecules
 - (e) a proton is much more massive than an electron
 - (f) the speed of sound is much smaller than the speed of light.
- 3 A new unit of length is chosen such that the speed of light in vacuum is unity. What is the distance between the Sun and the Earth in terms of the new unit if light takes 8 min and 20 s to cover this 3

MOTION IN STRAIGHT LINE

Day-3

- 1 What does slope of position-time graph represent for a uniform motion. 2
- 2 Under what condition is the average velocity equal to instantaneous velocity? 2
- 3 Mention the condition when an object in motion (a) can be considered point object (b) can not be considered point object. 2
- 4 The displacement – time graph for two particles A and B are straight line inclined at angles of 30° and 45° with the time axis. What is ratio of the velocities $V_A : V_B$ 2
- 5 In which of the following examples of motion, can the body be considered approximately a point object: 2
 - (a) a railway carriage moving without jerks between two stations.
 - (b) a monkey sitting on top of a man cycling smoothly on a circular track.

Day-4

- 1 A player throws a ball upwards with an initial speed of 29.4 m s^{-1} . 3
 - (a) What is the direction of acceleration during the upward motion of the ball ?
 - (b) What are the velocity and acceleration of the ball at the highest point of its motion ?
- 2 A woman starts from her home at 9.00 am, walks with a speed of 5 km h^{-1} on a straight road up to her office 2.5km away, stays at the office up to 5.00 pm, and returns home by an auto with a speed of 25 km h^{-1} . Choose suitable scales and plot the $x-t$ graph of her motion 3
- 3 Derive equation of motion of a uniformly accelerated motion by calculus method. 3

- 4 A ball is thrown vertically upwards with a velocity of 20 m s^{-1} from the top of a multistorey building. The height of the point from where the ball is thrown is 25.0 m from the ground. (a) How high will the ball rise ? and (b) how long will it be before the ball hits the ground? Take $g = 10 \text{ m s}^{-2}$. 3

Day-5

- 1 A ball is thrown vertically upwards with a velocity of 20 m s^{-1} from the top of a multistorey building. The height of the point from where the ball is thrown is 25.0 m from the ground. (a) How high will the ball rise ? and (b) how long will it be before the ball hits the ground? Take $g = 10 \text{ m s}^{-2}$. 3
- 2 Discuss the motion of an object under free fall. Neglect air resistance. 3
- 3 Stopping distance of vehicles : When brakes are applied to a moving vehicle, the distance it travels before stopping is called stopping distance. It is an important factor for road safety and depends on the initial velocity (v_0) and the braking capacity, or deceleration, $-a$ that is caused by the braking. Derive an expression for stopping distance of a vehicle in terms of v_0 and a . 3
- 4 Galileo's law of odd numbers : "The distances traversed, during equal intervals of time, by a body falling from rest, stand to one another in the same ratio as the odd numbers beginning with unity [namely, 1: 3: 5: 7.....]." Prove it. 3

Day-6

- 1 A drunkard walking in a narrow lane takes 5 steps forward and 3 steps backward, followed again by 5 steps forward and 3 steps backward, and so on. Each step is 1 m long and requires 1 s . Plot the $x-t$ graph of his motion. Determine graphically and otherwise how long the drunkard takes to fall in a pit 13 m away from the start 3
- 2 A car moving along a straight highway with speed of 126 km h^{-1} is brought to a stop within a distance of 200 m . What is the retardation of the car (assumed uniform), and how long does it take for the car to stop ? 3
- 3 A player throws a ball upwards with an initial speed of 29.4 m s^{-1} . (a) What is the direction of acceleration during the upward motion of the ball ? (b) What are the velocity and acceleration of the ball at the highest point of its motion ? (c) Choose the $x = 0 \text{ m}$ and $t = 0 \text{ s}$ to be the location and time of the ball at its highest point, vertically downward direction to be the positive direction of x -axis, and give the signs of position, velocity and acceleration of the ball during its upward, and downward motion. (d) To what height does the ball rise and after how long does the ball return to the player's hands ? (Take $g = 9.8 \text{ m s}^{-2}$ and neglect air resistance). 5

Day-7

- 1 Read each statement below carefully and state with reasons and examples, if it is true or false ; A particle in one-dimensional motion (a) with zero speed at an instant may have non-zero acceleration at that instant (b) with zero speed may have non-zero velocity, (c) with constant speed must have zero acceleration, (d) with positive value of acceleration must be speeding up. 5
- 2 A ball is dropped from a height of 90 m on a floor. At each collision with the floor, the ball loses one tenth of its speed. Plot the speed-time graph of its motion between $t = 0$ to 12 s . 3
- 3 Explain clearly, with examples, the distinction between : (a) magnitude of displacement (sometimes called distance) over an interval of time, and the total length of path covered by a particle over the same interval; (b) magnitude of average velocity over an interval of time, and the average speed over the same interval. [Average speed of a particle over an interval of time is defined as the total path length divided by the time interval]. Show in both (a) and (b) that the second quantity is either greater than or equal to the first. When is the equality sign true ? [For simplicity, consider one-dimensional motion only]. 5

Day-8

Motion in plane

- 1 Rain is falling vertically with a speed of 35 m s^{-1} . Winds starts blowing after sometime with a speed of 12 m s^{-1} in east to west direction. In which direction should a boy waiting at a bus stop hold his umbrella ? 3
- 2 Find the magnitude and direction of the resultant of two vectors A and B in terms of their magnitudes and angle θ between them. 3
- 3 Define unit vector. What is its use 2

- 4 A motorboat is racing towards north at 25 km/h and the water current in that region is 10 km/h in the direction of 60° east of south. Find the resultant velocity of the boat 3

Day-9

- 1 The position of a particle is given by $\mathbf{r} = 3.0t\mathbf{i} - 2.0t^2\mathbf{j} + 4.0t\mathbf{k}$ m where t is in seconds and the coefficients have the proper units for \mathbf{r} to be in metres (a) Find the \mathbf{v} and \mathbf{a} of the particle? (b) What is the magnitude and direction of velocity of the particle at $t = 2.0$ s ? 5
- 2 A particle starts from origin at $t=0$ when a velocity $5.0\mathbf{i}$ m/s and moves in x-y plane under action of a force which produces a constant acceleration of $(3.0\mathbf{i} + 2.0\mathbf{j})\text{m/s}^2$ 5
- (a) what is the y- co-ordinate of the particle at the instant its x- coordinate is 84m?
- (b) What is the speed of the particle at this time?
- 3 State, for each of the following physical quantities, if it is a scalar or a vector : volume, mass, speed, acceleration, density, number of moles, velocity, angular frequency, displacement, angular velocity. 3
- 4 On an open ground, a motorist follows a track that turns to his left by an angle of 60° after every 500 m. Starting from a given turn, specify the displacement of the motorist at the third, sixth and eighth turn. Compare the magnitude of the displacement with the total path length covered by the motorist in each case. 3

Day-10

- 1 Pick out the two scalar quantities in the following list : force, angular momentum, work, current, linear momentum, electric field, average velocity, magnetic moment, relative velocity. 3
- 2 Pick out the only vector quantity in the following list : Temperature, pressure, impulse, time, power, total path length, energy, gravitational potential, coefficient of friction, charge 3
- 3 State with reasons, whether the following algebraic operations with scalar and vector physical quantities are meaningful : (a) adding any two scalars, (b) adding a scalar to a vector of the same dimensions , (c) multiplying any vector by any scalar, (d) multiplying any two scalars, (e) adding any two vectors, (f) adding a component of a vector to the same vector 5
- 4 A passenger arriving in a new town wishes to go from the station to a hotel located 10 km away on a straight road from the station. A dishonest cabman takes him along a circuitous path 23 km long and reaches the hotel in 28 min. What is (a) the average speed of the taxi, (b) the magnitude of average velocity ? Are the two equal ? 5

MATHEMATICS

Section A (Sets)

Day – 1 (1 mark each)

1. Is a collection of novels written by the writer Munshi Prem Chand set? Justify your answer
2. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol \in or \notin in the blank space: $5 \dots A$
3. Let $A = \{1, 2, 3, 4, 5, 6\}$. Insert the appropriate symbol \in or \notin in the blank space: $8 \dots A$
4. Write the set in roster form: $A = \{x : x \text{ is an integer and } -3 \leq x < 7\}$
5. Write the set in roster form: $C = \{x : x \text{ is a two-digit natural number such that the sum of its digits is } 8\}$
6. Write the set in roster form: $D = \{x : x \text{ is a prime number which is divisor of } 60\}$
7. Write the set in roster form: $E =$ The set of all letters in the word **TRIGONOMETRY**
8. Write the set in the set-builder form: $\{5, 25, 125, 625\}$
9. Write the set in the set-builder form: $\{1, 4, 9, \dots, 100\}$
10. List the element of the set: $D = \{x : x \text{ is a letter in the word "LOYAL"}\}$

Day – 2

11. List the element of the set: $E = \{x : x \text{ is a month of a year not having } 31 \text{ days}\}$ 1
12. Match each of the set on the left in the roster form with the same set on the right described in set-builder form: 2

a. $\{1, 2, 3, 6\}$	i. $\{x : x \text{ is a prime number and a divisor of } 6\}$
b. $\{2, 3\}$	ii. $\{x : x \text{ is an odd natural number less than } 10\}$
c. $\{M, A, T, H, E, I, C, S\}$	iii. $\{x : x \text{ is natural number and divisor of } 6\}$
d. $\{1, 3, 5, 7, 9\}$	iv. $\{x : x \text{ is a letter of the word MATHEMATICS}\}$.

13. Is the set of months of a year is a finite or infinite set? 1
14. Is $y : y$ is a point common to any two parallel lines null set? 1
15. Is the set of positive integers greater than 100 finite or infinite set? 1
16. State whether $A = B$ or not if set $A = \{2, 4, 6, 8, 10\}$ and set $B = \{x : x \text{ is positive even integer and } x \leq 10\}$ 1
17. State whether $A = B$ or not if set $A = \{x : x \text{ is a multiple of } 10\}$ and set $B = \{10, 15, 20, 25, 30, \dots\}$ 1
18. Is the pair of set $A = \{2, 3\}$ and $B = \{x : x \text{ is solution of } x^2 + 5x + 6 = 0\}$ equal? Give reason. 1
19. Is pair of set $A = \{x : x \text{ is a letter of the word FOLLOW}\}$ and $B = \{x : x \text{ is a letter of the word WOLF}\}$ equal? Give reasons. 1

Day – 3

20. Make correct statement by filling the symbol \subset or $\not\subset$ in the blank space: $\{2, 3, 4\} \dots \{1, 2, 3, 4, 5\}$ 1
21. Make correct statement by filling the symbol \subset or $\not\subset$ in the blank space: $\{x : x \text{ is an equilateral triangle in a plane}\} \{x : x \text{ is a triangle in the same plane}\}$ 1
22. State true or false: $\{x : x \text{ is an even natural number less than } 6\} \subset \{x : x \text{ is a natural number which divides } 36\}$ 1
23. Let $A = \{1, 2, \{3, 4\}, 5\}$. Is the statement $\phi \subset A$ incorrect and why? 1
24. Write the interval $(-3, 0)$ in set builder form. 1
25. Write the interval $(6, 12]$ in set builder form. 1
26. What universal set would you propose: The set of right triangles. 1
27. What universal set would you propose: The set of isosceles triangles. 1
28. Given the sets $A = \{1, 3, 5\}$, $B = \{2, 4, 6\}$ and $C = \{0, 2, 4, 6, 8\}$, Is ϕ considered as universal set for all

the three sets A, B and C?

1

29. Find the union pair of set: $A = \{x : x \text{ is a natural number and } 1 < x \leq 6\}$ and $B = \{x : x \text{ is a natural number and } 6 < x < 10\}$ 1
30. Find the intersection pair of the set : $A = \{x : x \text{ is a natural number and multiple of } 3\}$, $B = \{x : x \text{ is a natural number less than } 6\}$ 1

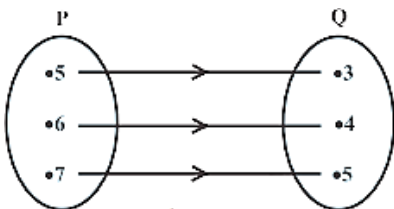
Day – 4

31. Find the intersection pair of the set: $A = \{1, 2, 3\}$, $B = \phi$ 1
32. If $A = \{3, 5, 7, 9, 11\}$, $B = \{7, 9, 11, 13\}$, $C = \{11, 13, 15\}$ and $D = \{15, 17\}$ find: $(A \cap B) \cap (B \cup C)$ 2
33. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{1, 2, 3, 4\}$, $B = \{2, 4, 6, 8\}$ and $C = \{3, 4, 5, 6\}$. Find: $(B - C)'$ 2
36. Taking the set of natural numbers as the universal set, write down the complement of the set: $\{x : x \text{ is a positive multiple of } 3\}$ 2
37. Draw appropriate Venn diagram for: $A' \cap B'$ 2
Let U be the set of all triangles in a plane. If A is the set of all triangles with at least one angle different from 60° what is A' ? 2
38. Decide among the following sets which sets are subsets of each another: $A = \{x : x \in \mathbb{R} \text{ and } x \text{ satisfies } x^2 - 8x + 12 = 0\}$, $B = \{2, 4, 6\}$, $C = \{2, 4, 6, 8, \dots\}$, $D = \{6\}$ 2
39. State true or false:
If $A \subset B$ and $B \subset C$, then $A \subset C$. If it is true, prove it. If it is false, give an example. 2

Section B (Relations and functions)

Day – 5

40. If $A = \{-1, 1\}$ find $A \times A \times A$ 1
41. Let $A = \{1, 2\}$ and $B = \{3, 4\}$. Write $A \times B$. How many subsets will $A \times B$ have? List them. 2
42. The Cartesian product $A \times A$ has 9 elements among which are found $(-1, 0)$ and $(0, 1)$. Find the set A and the remaining elements of $A \times A$. 2
43. Define a relation R on the set N of natural numbers by $R = \{(x, y) : y = x + 5, x \text{ is a natural number less than } 4; x, y \in N\}$. Depict this relationship using roster form. Write down the domain and the range. 2
44. The figure shows a relationship between the sets P and Q . Write this relation in the set-builder form. What is its domain and range? 2



45. Let $A = \{1, 2, 3, 4, 6\}$. Let R be the relation on A defined by $\{(a, b) : a, b \in A, b \text{ is exactly divisible by } a\}$.
- Write R in roster form 3
 - Find the domain of R
 - Find the range of R .

Day – 6 (2 marks each)

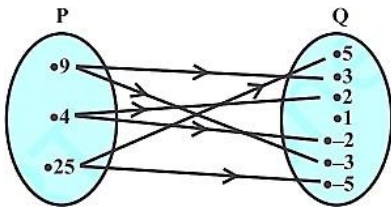
46. Set R be the relation on Z defined by $R = \{(a, b) : a, b \in Z, a - b \text{ is an even integer}\}$. Find the domain and range of R .
47. State that the given relation is a function? Give reason. If it is a function, determine its domain and

range. $\{(2, 1), (5, 1), (8, 1), (11, 1), (14, 1), (17, 1)\}$

48. Find the domain and range of the real function: $f(x) = -|x|$
49. Find the domain and range of the real function: $f(x) = \sqrt{9-x^2}$
50. A function f is defined by $f(x) = 2x - 5$. What is the value of $f(7)$?
51. Find the range of $f(x) = 2-3x, x \in \mathbb{R}, x > 0$.
52. Find the range of $f(x) = x^2 + 2, x$ is a real number.
53. Find the range of $f(x) = x, x$ is a real number.
56. Let $A = \{1, 2, 3\}, B = \{3, 4\}$ and $C = \{4, 5, 6\}$. Find: $(A \times B) \cap (A \times C)$

Day – 7 (2 marks each)

57. Let $A = \{1, 2, 3, 4, 5, 6\}$. Define a relation R from A to A by $R = \{(x, y) : y = x + 1\}$. Depict this relation using an arrow diagram.
58. The fig. shows a relation between the sets P and Q . Write this relation in roster form. What is its domain and



range?

59. Tell whether the given relation is a function or not? Justify: $R = \{(1, 2), (2, 3), (3, 4), (4, 5), (5, 6), (6, 7)\}$
60. Let $f(x) = \sqrt{x}$ and $g(x) = x$ be two functions defined over the set of non-negative real numbers. Find $(f+g)(x), (f-g)$ and $(F)(x)$.
61. Let \mathbb{R} be the set of real numbers. Define the real function $f: \mathbb{R} \rightarrow \mathbb{R}$ by $f(x) = x + 10$ and sketch the graph of this function.
62. Let R be a relation from \mathbb{Q} to \mathbb{Q} defined by $R = \{(a, b) : a, b \in \mathbb{Q} \text{ and } a - b \in \mathbb{Z}\}$. Show that $(a, a) \in R$ for all $a \in \mathbb{Q}$
63. Find the domain of the function X^3
64. If $F(X) = X^2$ Find $F(1.1) - F(1)$
64. Find the domain and the range of the real function f defined by $f(x) = \sqrt{x-1}$.
65. Find the domain and the range of the real function f defined by $f(x) = |x - 1|$.
66. Let $f = \{(1, 1), (2, 3), (0, -1), (-1, -3)\}$ be a function from \mathbb{Z} to \mathbb{Z} defined by $f(x) = ax + b$, for some integers a, b . Determine a, b .
67. If $A = \{9, 10, 11, 12, 13\}$ and $f : A \rightarrow \mathbb{N}$ be defined by $f(n) =$ the highest prime factor of n . Find the range of f .

Day – 8

68. Let f be the subset of $\mathbb{Z} \times \mathbb{Z}$ defined by $f = \{ab, a+b : a, b \in \mathbb{Z}\}$. Is f a function from \mathbb{Z} to \mathbb{Z} ? Justify your answer. 2
69. Let R be a relation from \mathbb{N} to \mathbb{N} defined by $R = \{(a, b) : a, b \in \mathbb{N} \text{ and } a = b^2\}$. Is the given statement true? $(a, b) \in R$, implies $(b, a) \in R$? Justify your answer. 2
70. Find the domain of each of the following real valued functions:- (2 marks each)

- a) $\frac{1}{x+2}$ b) $\frac{x-1}{x-3} \cdot \frac{2x-3}{x^2-3x+2}$ d) $\sqrt{x-2}$ e) $\frac{1}{\sqrt{1-x}}$

Day – 9 (2 marks each)

71. Find the domain and range of each of the following real valued functions:-

a) $f(x) = \frac{x-2}{3-x}$ b) $f(x) = \frac{1}{\sqrt{1-x}}$ c) $f(x) = \sqrt{16-x^2}$ d) $f(x) = \frac{x}{1+x^2}$ e) $f(x) = \frac{3}{2-x^2}$

f) $f(x) = \frac{x^2-9}{x^2-3}$

Day – 10

Case Study (5 marks)

A class teacher Mamata Sharma of class XI writethree sets A, B and C are such that $A = \{1, 3, 5, 7, 9\}$, $B = \{2, 4, 6, 8\}$ and $C = \{2, 3, 5, 7, 11\}$. Answer the following questions which are based on above sets.

(i) Find $A \cap B$.

- (a) $\{3, 5, 7\}$ (b) ϕ
 (c) $\{1, 5, 7\}$ (d) $\{2, 5, 7\}$

(ii) Find $A \cap C$

- (a) $\{3, 5, 7\}$ (b) ϕ
 (c) $\{1, 5, 7\}$ (d) $\{3, 4, 7\}$

(iii) Which of the following is correct for two sets A and B to be disjoint?

- (a) $A \cap B = \phi$ (b) $A \cap B \neq \phi$
 (c) $A \cup B = \phi$ (d) $A \cup B \neq \phi$

(iv) Which of the following is correct for two sets A and C to be intersecting?

- (a) $A \cap C = \phi$ (b) $A \cap C \neq \phi$
 (c) $A \cup C = \phi$ (d) $A \cup C \neq \phi$

(v) Write the $n[P(B)]$.

- (a) 8 (b) 4
 (c) 16 (d) 12

2- Find the domain and the range of the function $f(x) = 3x^2 - 5$. Also find $f(-3)$ and the numbers which are associated with the number 43 in its range. 2

3-Let a relation $R = \{(0, 0), (2, 4), (-1, 2), (3, 6), (1, 2)\}$ then 4

(i) write domain of R

(ii) write range of R

(iii) write R the set builder form

(iv) represent R by an arrow diagram

4-Define modulus function Draw graph and also find domain and range.

CHEMISTRY

Chapter- Some Basic Concepts of Chemistry

Day-1

1. The isotopes of an element have 1
 - (a) Same atomic number
 - (b) same atomic mass
 - (b) Same neutron
 - (d) different atomic number
2. Define an atom. 1
3. What do you understand by molecules and how are they classified on the basis of the type of elements? 2
4. Calculate the number of moles and number of molecules in (i) 4.4 g of CO₂. (ii) 4.9 gram H₂SO₄ (iii) 2 gram H₂ 3
5. Chlorine is prepared in the laboratory by treating manganese dioxide (MnO₂) with aqueous hydrochloric acid according to the reaction
$$4\text{HCl}(\text{aq}) + \text{MnO}_2(\text{s}) \rightarrow 2\text{H}_2\text{O}(\text{l}) + \text{MnCl}_2(\text{aq}) + \text{Cl}_2(\text{g}).$$
5

How many grams of HCl react with 5.0g of manganese dioxide?

Day-2

1. Chemical equation is balanced according to the law of 1
 - (a) constant proportion
 - (b) multiple proportion
 - (c) conservation of mass
 - (d) reciprocal proportion
2. What is heteroatomic molecule? 1
3. An organic compound contains C = 40%, H = 6.6%. If the Vapour density of the compound is 15, find its molecular formula. (Hint: Molecular Mass = 2×vapour density) 2
4. Calculate which of the following has the highest mole? 3
 - (i) 4 g of NaOH
 - (ii) 4 g of HCl
 - (iii) 4 g of H₂SO₄
5. Calcium carbonate reacts with aqueous HCl to give CaCl₂ and CO₂ according to the reaction, 5
$$\text{CaCO}_3(\text{s}) + 2\text{HCl}(\text{aq}) \rightarrow \text{CaCl}_2(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$$

What mass of CaCO₃ is required to react completely with 146 gram HCl ?

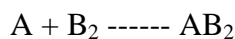
Day-3

1. The isobars of different element have 1
 - (a) Same atomic number
 - (c) same atomic mass
 - (b) Different atomic mass
 - (d) different atomic number
2. Define molecule. 1
3. What do you understand by molecular mass? What is the molecular mass of ethanol? 2
4. Calculate the number of molecules in (i) 3.2 g of O₂. (ii) 28 gram N₂ (iii) 7.1 gram Cl₂ 3
5. An organic compound has 68.327% C, 6.406% H, 25.267% Cl. Calculate the molecular formula of the compound if its vapour density is 70.25. 5

Day-4

1. Water and hydrogen peroxide are the example of law of 1
 - (a) constant proportion
 - (b) multiple proportion

- (c) conservation of mass (d) reciprocal proportion
- What is limiting reagent? 1
 - What is empirical formula and molecular formula? 2
 - Calculate the number of atoms in (i) 46 g of Na. (ii) 12 gram C (iii) 655 gram Cu 3
 - In a reaction 5



Identify the limiting reagent, if any, in the following reaction mixtures.

- 300 atoms of A + 200 molecules of B
- 2 mol A + 3 mol B
- 100 atoms of A + 100 molecules of B
- 5 mol A + 2.5 mol B
- 2.5 mol A + 5 mol B

Day-5

- Number of mole present in 1.8 gram H₂O 1
 - 1
 - 0.1
 - 2
 - 5
- What is percentage composition of element? 1
- Calculate mass percentage of each element in CO₂ 2
- Calculate the mass of iron which will be converted into Fe₃O₄ by the action of 18 gram steam on it. 3
- Two oxides of carbon contain 57.2% and 72.3% oxygen. Show that these data confirms the law of multiple proportion. 5

Day-6

- Number of mole present in 49 gram H₂SO₄ 1
 - 1
 - 0.1
 - 2
 - 0.5
- What is law of conservation of mass? 1
- Calculate mass percentage of each element in NH₃. 2
- 17 gram AgNO₃ is treated with 25 gram HCl. What is the mass of AgCl formed? 3
- What are the postulates of Dalton's Atomic Theory? 5

Day-7

- Molar volume of gas is
 - 224 L
 - 22L
 - 22.4 L
 - 2 L
- What is excess reagent?
- Calculate mass percentage of water in CuSO₄.5H₂O.
- A compound contains 93.71% carbon and 6.29% hydrogen. It's molar mass is 128 g/mol. Calculate it's molecular formula.
- 10 litre H₂S and 10 litre SO₂ are made to react at NTP. Calculate the mass of the gas left untreated.

Day-8

1. Teacher of chemistry, Dr. Prachi Sawhney, asked her student, Simi, to perform an experiment to verify the law of conservation of mass. She weighed 0.520 gram of sodium sulphate (Na_2SO_4) and dissolved it in 30 ml of water. Total weight of the solution was 30.520 gram. Then she weighed 0.480 gram of NaCl and dissolved it in 20 ml of water. The total mass of solution was 20.480 gram. Then she mixed the two solutions together in a conical flask. She stirred the contents of the flask and found that the total mass of the solution was 51.0 gram, i. e., there was no change in the total mass of the two solutions. Now answer the following questions:
- (i) Do these observations verify the law of conservation of mass? 1 x 4
- (ii) If not, what is wrong with this experiment?
- (iii) What do you suggest Simi to get the law verified?
- (iv) What is the value associated with this experiment?
2. Value of Avogadro's number (N) is 6.02×10^{23} Atomic mass of an element is equal to the mass of 6.02% 10 atoms of an element. Mole concept has made chemical equations easy: With the help of mole concept, it is easy to calculate the mass of one atom of an element or mass of one molecule of a compound. Now answer the following questions:
- (i) Mole is called chemist's dozen, comment. 1x3
- (ii) How many years would it take to spend Avogadro's number of rupees at the rate of 10 lac rupees per day?
- (iii) What values are associated with mole concept?
3. **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. 1
4. **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 1.
5. **Assertion :** One atomic mass unit is defined as one twelfth of the mass of one carbon – 12 atom. 1
- Reason :** Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.

Chapter- Structure of Atom

Day-9

- 1-Which of the following pairs represents isobars? 1
- (a) ${}^3\text{He}_2$ and ${}^4\text{He}_2$
- (b) ${}^{24}\text{Mg}_{12}$ and ${}^{25}\text{Mg}_{12}$
- (c) ${}^{40}\text{K}_{19}$ and ${}^{40}\text{Ca}_{20}$
- (d) ${}^{40}\text{K}_{19}$ and ${}^{39}\text{K}_{19}$
- 2-Arrange s, p and d sub-shells of a shell in the increasing order of effective nuclear charge (Z_{eff}) experienced by the electron present in them. 1
- 3- Calculate the total number of angular nodes and radial nodes present in the 3p orbital. 2
- 4-(i) An atom having atomic mass number 13 has 7 neutrons. What is the atomic number of the atom? 3
- (ii) What is the difference between the terms orbit and orbital?
- 5-i) Table-tennis ball has a mass of 10 g and a speed of 90 m/s. If speed can be measured with an accuracy of 4% what will be the uncertainty in speed and position?
- ii) Explain property of cathode rays 5

Day-10

1-How many orbitals can have the following set of quantum numbers, $n = 3, l = 1, m_l = 0$?

1

(a) 3. (b) 1. (c) 4. (d) 2

2-Calculate the number of electrons which will together weigh one gram.

1

3-How many protons and neutrons are present in the following nuclei carbon and Argon.

2

4- Calculate the energy of each of the photons which

3

(i) correspond to light of frequency 3×10^{15} Hz

(ii) have wavelength of 0-50 Å.

5 -The energy associated with first orbit in hydrogen atom is -2.17×10^{-18} J atom⁻¹. What is the energy associated with the fifth orbit ?

(ii) Calculate the radius of Bohr's fifth orbit for hydrogen atom.

5

RADIANT CENTRAL CHILDREN ACADEMY

Holiday Homework Computer Science (XI)

Q1. Write a program to check whether a person is eligible for voting or not. (accept age from user)

Q2. Write a program to check whether a number entered by user is even or odd.

Q3. Write a program to check whether a number is divisible by 7 or not.

Q4. Write a program to display "Hello" if a number entered by user is a multiple of five, otherwise print "Bye".

Q5. Write a program to calculate the electricity bill (accept number of units from user) according to the following criteria:

Unit	Price
First 100 units	no charge
Next 100 units	Rs 5 per unit
After 200 units	Rs 10 per unit

(For example, if input unit is 350 than total bill amount is Rs2000)

Q6. Write a program to display the last digit of a number.

(hint: any number % 10 will return the last digit)

Q7. Write a program to check whether the last digit of a number (entered by user) is divisible by 3 or not.

Q8. Write a program to accept percentage from the user and display the grade according to the following criteria:

Marks	Grade
> 90	A
> 80 and <= 90	B
>= 60 and <= 80	C
below 60	D

Q9. Accept any city from the user and display monument of that city.

City	Monument
Delhi	Red Fort
Agra	Taj Mahal
Jaipur	Jal Mahal

Q10. Write a program to check whether a number entered is three-digit number or not.

Q11. Write a program to check whether a person is eligible for voting or not. (voting age >=18)

Q12. Write a program to check whether a person is senior citizen or not.

Q13. Write a program to find the lowest number out of two numbers excepted from user.

Q14. Write a program to whether a number (accepted from user) is divisible by 2 and 3 both.

Q15. Write a program to find the largest number out of three numbers excepted from user.

Q16. Accept the following from the user and calculate the percentage of class attended:

- Total number of working days
- Total number of days for absent

Q17. Write a program to accept two numbers and mathematical operators and perform operation accordingly.

Like:

Enter First Number: 7

Enter Second Number : 9

Enter operator : +

Your Answer is : 16

Q18. Accept the number of days from the user and calculate the charge for library according to following:

Till five days : Rs 2/day.

Six to ten days : Rs 3/day.

11 to 15 days: Rs 4/day

After 15 days: Rs 5/day

Q19. Accept the kilometers covered and calculate the bill according to the following criteria:

First 10 Km Rs11/km

Next 90Km Rs 10/km

After that Rs9/km

Q20. Write a program to accept a number from 1 to 12 and display name of the month and days in that month like 1 for January and number of days 31 and so on.

Q21. Write a program to convert and print this distance in meters, feet, inches and centimeters.

Q22. Amit basic salary is input through the keyboard. His dearness allowance is 50% of basic salary, and house rent allowance is 50% of basic salary. Write a program to calculate his gross salary.

Q23. If a five-digit number is input through the keyboard, write a program to calculate the sum of its digits. (Hint: Use the modulus operator '%')

Q24. If a four-digit number is input through the keyboard, write a program to obtain the sum of the first and last digit of this number.

Q25. If the marks obtained by a student in five different subjects are input through the keyboard, find out the aggregate marks and percentage marks obtained by the student. Assume that the maximum marks that can be obtained by a student in each subject is 100.

Q26. Write a python code to input two numbers. Display the numbers after swapping them without using built-in function or a third variable.

Q27. Write a python program to find difference between compound interest and simple interest.

Q28. Convert Decimal number into, binary, octal and Hexadecimal number.

1. (24)₁₀ 2. (240)₁₀ 3. (124)₁₀ 4. (204)₁₀ 5. (54)₁₀

Q29. Convert Binary number into, Decimal, octal and Hexadecimal number.

1. (10101)₂ 2. (110101)₂ 3. (1010110)₂ 4. (1001101)₂ 5. (100100101)₂

Q30. Differentiate between RAM and ROM.

Physical education

Day-1

Unit-1 changing trends and career in physical education

1-what is the aim of physical education? - 1

A-Physical development

B-psychological development

C-motor development D- all of these.

2-In which city khelo India games were played first? - **1 mark**

A-New Delhi B-Pune

C-Chennai D-Mumbai.

3-What are the main objectives of physical education? -**3 marks**

4-Enlist any five productive gears and the sports with which they are associated. -**3 marks**

Day-2

1-Rishan a 17 years old boy, is an outstanding athlete of class 12. He wants to get trained under National coaches,which is possible only if he performs excellently in the khelo India program. - **4 marks**

1-Rishan wants to perform in khelo India youth games part of the khelo India program that are organised. -**1 mark**

A-Every year. B- after every 2 years

C-After every 3 years

D-After every 4 years

2-In which city Rishan can find the headquarter of the khelo India program? -**1 mark**

A-Patiala. B- Delhi

C-Bangalore D-Chennai

2-Explain technology advancement with reference to changing trends and career in physical education. -**5 marks**

3-Write a short note on Fit India program. - **3 marks**

Day-3

A) Both (A)and (R) are true and (R) is a correct explanation of (A).

B) Both (A) and (R) are true but (R)is not the correct explanation of (A).

C)(A) is true but (R) is false.

D)(A) is false but (R)is true.

1-Assertion(A)-physical education is an integral component of education. - **1 mark**

Reason(R) - Physical education is concerned with the development of body mind and soul of a person.

2-Assertion(A)-sports photographs click photos during National and international sports events. - **1 marks**

Reason(R) - pictures clicked by sports photographers can be used to write stories and articles.

3-Describe the khelo India program. -**3marks**

Day-4

1-State the career options in physical education. - **5 marks**

2-Describe the development of physical education in India- post independence. - **5 marks**

Day-5

Radhika student of class 12, is brilliant in academics as well as in sports she can have a profitable career in academics but Radhika wants to pursue a career in any of the sectors of her interest in physical education. - **4 marks**

1-Which career option is available in the health-related sector in physical education for Radhika?

A- Professional player

B-photograph for sports

C-psychologist F-sports host

2- Which career option Radhika would find in the media and communication sector in physical education?

- A- Sports journalist
- B-Sports photographs
- C-Sports physiotherapist
- D- Both A and B

3-The career that Radhika can choose in the sports training sector in physical education is:

- A- Teacher in a middle school
- B- Teacher in a high school
- C- Coach in a high school
- D- Author of a physical education book

Day-6

Unit-2 Olympic value education

1-In ancient Olympics winner were awarded with; - **1 marks**

- A- Cup and trophies
- B-Medals B-certificate
- D- Olive crown

2-The place where the Olympic flame lit before Olympic games is: - **1 marks**

- A- Capital city of host nation
- B- Capital city of Asia
- C-Olympia D-Athens

3-Explain the concept and fundamental principles of olympism. - **3 marks**

4-Give a brief description about Olympic flame, Anthem and Oath. - - 2 marks

Day-7

1-How many Olympic values are? Explain friendship.- **2 marks**

2-Explain the meaning of excellence. -**2 marks**

3-Enlist the Olympic value education.explain joy of effort,balance between body,will and mind.- **3 marks**

4-Give a brief account of the Ancient and Modern Olympic games. - **5 marks**

Day-8

1-In which year International Olympic committee was constituted? -**1 marks**

A-1892. B-1894 C-1896 D-1919

2-The Olympic anthem was composed by:-**1 marks**

- A-Pierre De Coubertin
- B- Narendra Dhruv
- C- Demetrious vikelas
- D- Spyridon Samaras

3-The Motto of Olympics is: - **1 mark**

- A-Citius,Altius,Fortius
- B-Per LudosAequalities
- C-Spirit in motion D- ASEAN

4-Modern olympic was started in: - **1mark**

A- 1894 B-1896 C-1919 D-1892

5-Write a short note on NOC and IFS -**3 marks**

6-Give a brief description about Olympic flame, Anthem and Oath. - **5 marks**

Day-9

Unit-3 Yoga

1-Who said"Oneness of man with God is yoga"? -**1 mark**

- A-Agam B- Bharti krishna Tirtha
- C-Patanjali D-Bhagwad Gita

2-Which organ is benefitted from tratak kriya? -1 mark

A- Liver B-Kidneys

C-Digestion system D-Eyes

3-Svadhya means..... -1 mark

A-Selfishness B-introspection

C-purity D-Contentment

A. Both (A)and (R) are true and (R) is a correct explanation of (A).

B. B) Both (A) and (R) are true but (R)is not the correct explanation of (A).

(A) is true but (R) is false.

C. is false but (R)is true.

4-Assertion(A)-Yama is the first elements of yoga. - 1 mark

Reason(R)Satya, Ahimsa,Asteya,Brahmcharya and Aprigraha are five rules of Yama.

5-Assertion(A)-The steady control of the senses and mind is the yoga. - 1 mark

Reason(R) -Dharana is one of the elements of yoga.

6-What do you mean by yoga?Give a definition.-2 marks

Richa, faces difficulty in breathing and also not able to focus on studies and other things during a recent medical check up at school she was advised to practice Pranayam and meditation by yoga instructor for curing these difficulties. -4 marks

1-Pranayam suggest to Richa by yoga instructor will help in straightening A-muscular system B-Respiratory system C-Digestive system D-Lymphatic system

2- If Richa starts practising meditation, it will help to;

A-Calm her mind

B-Develop power of concentration

C- Lead to self knowledge D-All of these

3-Pranayam and samadhi are elements of:

A- Yoga B-Vedas

C-Upnishads D-Both B and C

4-How many elements are there in Yoga?-3 marks

5-State yogic kriyas.-3 marks

Day-10

1-What is meant by Yama?-2 marks

2- How many Niyamas are there in Yoga?-2 marks

4-How many elements are there in yoga?-3 marks

5-What is Pranayam ?Explain its types.- 5 marks