



ST. VIVEKANAND LOTUS VALEY PUBLIC SCHOOL
CLASS -IX
SESSION 2024-25



ENGLISH

MODULE 1 (BBC)

Assignment work:-Do solve following page numbers:

Reading Section :- page number 3 to 33

MODULE 2

Writing Section :- page number 80 to 93

MODULE 3 pg no 112 to 125

MODULE 5 Grammar

A Tenses:- page no.168 to176

b. Reported Speech :-page no. 184,185

c. Determiners:- pg no.203,204,205

MODULE 7

Literature:- pg no. 258 to 271, pg no- 302 to 307 & 312 to 315

MODULE 8

338 to 343

REVISE ALL CHAPTERS AND POEM (TEXTUAL Q/A, EXTRA Q/A, LONG Q/A ALONG WITH EXTRACTS) THOROUGHLY

Beehive (Prose)

Chapter- 1 (The Fun They Had)

Chapter- 2 (The Sound of Music) (Part I + II)

Poetry

The Road not Taken, Wind & Rain On The Roof

Moments

Chapter- 1 (The Lost Child)

Chapter- 2(The Adventure of Toto)

Project work

- **Make a project file on Robert Frost**
- **Write down the biography, Childhood, famous poems, Awards and facts A4 sheet only**
- **Write down a famous poem of Robert Frost on A4 sheet**

→ Watch English news daily in order to equip yourself with the information and facts to be used in as content in writing skills.

→Project on Communication Skills (Roll no 1 to 10) (Make it most effectively)

Reading

Speaking

Listening

Writing

→Make a Chart on Poetic Device (Mention Defines; Word & Sentence Example)

Roll no 11 to 20)

→Project on Modals (Roll no 21 and onwards)

Present your Project work creatively

Physical Activity Trainer

Note: write below questions in your notebook and also learn .

1. Role of physical education in child development
2. What are the physical and emotional needs of children.
3. Explain the factors influencing physical activity.
4. What are the physical activity plan & their importance.
5. Social and physical domain for early childhood.
6. Explain cognitive and affective domain of physical education.
7. Explain the factors influencing physical activities.
8. Write down the definition of ECTOMORPH, MESOMORPH, ENDOMORPH
9. What is nutrition and its importance
10. What is planning and its importance
11. What is ABC framework and their skills

Project work (On A3 sheets)

1. flow chart of physical abilities and mental abilities.
2. Flow chart of social & intellectual abilities.

Assignment work

1. Prepare assignment on physical education & their factors (minimum 10 pages)
2. Prepare assignment nutrition & * diet.
3. Assignment on ECTOMORPH, MESOMORPH, ENDOMORPH.

HINDI

1. एवरेस्ट मेरी यात्रा पाठ के आधार पर बछेंद्री पाल का जीवन परिचय लिखते हुए माउंट एवरेस्ट की विभिन्न चोटियों का चित्रण करते हुए एक परियोजना का निर्माण करें रंगीन चित्र सहित।
2. भारत के विभिन्न वैज्ञानिकों तथा उनकी उपलब्धियां पर एक परियोजना का निर्माण करें जिसमें उनके जीवन की जानकारी चित्रों सहित निहित हो।
3. संधि और उसके प्रकारों सहित एक वॉल हैंगिंग तैयार करें।
4. रहीम के दोहों का लेखन A4 शीट पर चित्र सहित करें।
5. उपसर्ग तथा प्रत्यय के विभिन्न शब्दों का वर्णन A4 शीट पर करें।
6. विभिन्न प्रश्नों के उत्तर ग्रीष्म अवकाश कार्य की पुस्तिका में लिखें।
 1. शिखर पर चढ़ने वालों को किन-किन कठिनाइयों का सामना करना पड़ता है और उनके क्या परिणाम होते हैं एवरेस्ट मेरी शिखर यात्रा पाठ के आधार पर बताएं।
 2. दुख का अधिकार कहानी में किन सामाजिक बुराइयों का उजागर किया गया है स्पष्ट करें।
 3. एवरेस्ट यात्रा में क्या-क्या तैयारी करनी पड़ती है पाठ के आधार पर स्पष्ट करें।
 4. कभी रैदास ने अन्य कवियों नामदेव, कबीर, त्रिलोचन, सदाना की चर्चा अपने कविता में क्यों की है वर्णन करें।
 5. धूल और मिट्टी में क्या अंतर है वर्णन करें।
 6. दुख का अधिकार कहानी से स्पष्ट होता है कि पैसे की कमी और अभाव आदमी को दुख मनाने का अधिकार भी नहीं देते कैसे और क्यों स्पष्ट करें।
 7. अखाड़े की मिट्टी की क्या-क्या विशेषताएं होती हैं अपने शब्दों में लिखें।
 8. गिल्लू पाठ के आधार पर गुल्लू की कुछ विशेषताओं का वर्णन करें जो उसे अन्य गिलहरियों से अलग करती है।
 9. हिमस्खलन क्या होता है? इससे क्या-क्या हानियां होती हैं?
 10. रैदास के पद प्रभु जी तुम घन बन हम मोर जैसे चितवत चंद चकोरा का भाव अपने शब्दों में स्पष्ट करें

7. निम्न कार्य को अपने हिंदी व्याकरण के आधार पर करें।
1. 5 से 10 तक अनुच्छेद लेखन अपनी उत्तर पुस्तिका में करें।
 2. किन्ही पांच संवादों का लेखन करें
 3. विभिन्न विषयों पर किन्ही पांच पत्रों का लेखन करें।
 4. अपठित गद्यांश 5 से 10 के प्रश्नों के उत्तर अपने अपनी उत्तर पुस्तिका में लिखें।

Science

- SOLVE THESE ASSIGNMENT IN YOUR SCIENCE NOTEBOOK.
- REVISE ALL THE WORK DONE IN YOUR NOTEBOOK.
- MAKE ANY THREE POSTER ON A3 SHEET ON THE GIVEN TOPIC.

- 1. newton's law of motion
- 2. Nerve cell
- 3. Save earth save water
- 4. Level of organisation
- 5. Osmosis
- 6. Air pollution
- 7. Fuel conservation
- 8. Save environment save human
- 9. 3 Rs
- 10. Faces of moon
- 11. Matter

- MAKE ONE WORKING MODEL ON THE MENTIONED ROLL NO. BELOW:

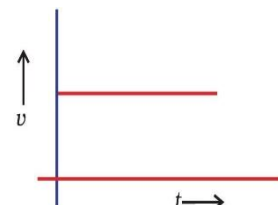
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|---|---------------------|
| 1. MICROSCOPE | ROLL NO. (1 TO 3) |
| 2. TYPES OF MOTION | ROLL NO. (4 TO 6) |
| 3. ACID RAIN | ROLL NO. (7 TO 10) |
| 4. CHANDRAYAAN -3 | ROLL NO. (11 TO 14) |
| 5. TYPES OF POLLUTION | ROLL NO. (15 TO 17) |
| 6. NEWTON'S 2 ND LAW OF MOTION | ROLL NO. (18 TO 20) |
| 7. PHASES OF MOON | ROLL NO. (21 TO 23) |
| 8. EARTHQUAKE ALARM | ROLL NO. (24 TO 27) |
| 9. SMOKE ALERT MACHINE | ROLL NO. (28 TO 30) |
| 10. NERVE CELL | ROLL NO (31 TO 33) |

ASSIGNMENT - 1

MOTION

Multiple Choice Questions

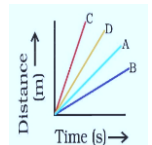
1. If the displacement of an object is proportional to square of time, then the object moves with
(A) uniform velocity (b) uniform acceleration (c) increasing acceleration (d) decreasing acceleration
2. The distance time graph of a body coincides with its time axis. The body must be
(A) in uniform motion (b) at rest (c) in uniformly accelerated motion (d) in zig-zag motion
3. From the given $v-t$ graph (see below Fig.), it can be inferred that the object is
(A) in uniform motion (b) at rest (c) in non-uniform motion (d) moving with uniform acceleration



4. The velocity time graph of a body is parallel to the time axis. The body is
 (A) at rest having uniform acceleration
 having zero acceleration having non-uniform acceleration
5. A particle is moving in a circular path of radius r . The displacement after half a circle would be:
 (a) Zero πr $2r$ $2\pi r$
6. A body is thrown vertically upward with velocity u , the greatest height h to which it will rise is,
 (A) u/g (b) $u^2/2g$ (c) u^2/g (d) $u/2g$
7. The numerical ratio of displacement to distance for a moving object is
 (A) always less than 1 always equal to 1 always more than 1
 equal or less than 1
8. Suppose a boy is enjoying a ride on a *merry-go-round* which is moving with a constant speed of 10 m/s. It implies that the boy is
 (A) at rest
 (B) moving with no acceleration
 (C) in accelerated motion
 (D) moving with uniform velocity
9. Area under $a - v - t$ graph represents a physical quantity which has the unit (a) m^2
 (b) m
 (c) m^3
 (d) m/s

10. Four cars A, B, C and D are moving on a levelled road. Their distance versus time graphs are shown in below Fig.. Choose the correct statement
 (a) Car A is faster than car D. (b) Car B is the slowest. (c) Car D is faster than car C.
 (d) Car C is the slowest.

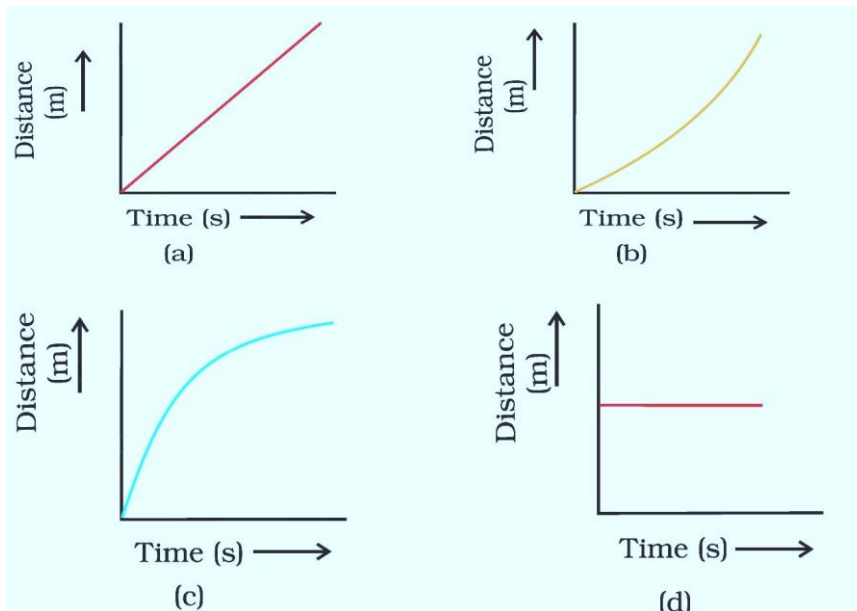
11. Slope of a velocity – time graph gives



- (A) the distance (b) the displacement (C) the acceleration (d) the speed

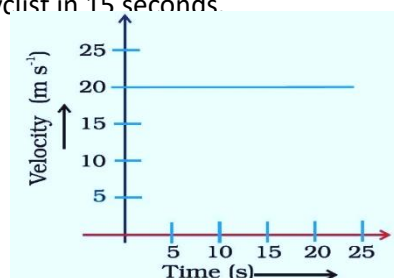
12. In which of the following cases of motions, the distance moved and the magnitude of displacement are equal?
 (A) If the car is moving on straight road (c) If the car is moving in circular path
 (b) The pendulum is moving to and fro (d) The earth is revolving around the Sun

13. Which of the following figures (see below Figure) represents uniform motion of a moving object correctly?



SHORT ANSWER QUESTIONS

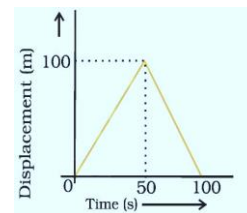
14. The displacement of a moving object in a given interval of time is zero. Would the distance travelled by the object also be zero? Justify your answer.
15. How will the equations of motion for an object moving with a uniform velocity change?
16. A car starts from rest and moves along the x -axis with constant acceleration 5 m/s^2 for 8 seconds. If it then continues with constant velocity, what distance will the car cover in 12 seconds since it started from the rest?
17. A motorcyclist drives from A to B with a uniform speed of 30 km/h and returns back with a speed of 20 km/h . Find its average speed.
18. Draw a velocity versus time graph of a stone thrown vertically upwards and then coming downwards after attaining the maximum height.
19. The velocity-time graph (see below Figure) shows the motion of a cyclist. Find (i) its acceleration (ii) its velocity and (iii) the distance covered by the cyclist in 15 seconds.



20. A girl walks along a straight path to drop a letter in the letterbox and comes back to her initial position. Her displacement-time graph is shown in below figure. Plot a velocity-time graph for the same.

LONG ANSWER QUESTIONS

21. An object starting from rest travels 20 m in first 2 s and 160 m in next 4 s. What will be the velocity after 7 s from the start.
22. An electron moving with a velocity of $5 \times 10^4 \text{ m/s}$ enters into a uniform electric field and acquires a uniform acceleration of 10^4 m/s^2 in the direction of its initial motion.
 - (i) Calculate the time in which the electron would acquire a velocity double of its initial velocity.
 - (ii) How much distance the electron would cover in this time?



23. Obtain a relation for the distance travelled by an object moving with a uniform acceleration in the interval between 4th and 5th seconds.
24. Two stones are thrown vertically upwards simultaneously with their initial velocities u_1 and u_2 respectively. Prove that the heights reached by them would be in the ratio of $u_1^2 : u_2^2$ (Assume upward acceleration is $-g$ and downward acceleration to be $+g$).
25. An object is dropped from rest at a height of 150 m and simultaneously another object is dropped from rest at a height 100 m. What is the difference in their heights after 2 s if both the objects drop with same accelerations? How does the difference in heights vary with time?

ASSIGNMENT -2

- Q1- Why are lysosome known as suicidal-bags of a cell?
- Q2- Do you agree that 'A cell is a building unit of an organism', If yes, explain why?
- Q3- Why does the skin of your finger shrink when you wash clothes for a long time?
- Q4- Why is endocytosis found in animals only?
- Q5- A person takes concentrated solution of salt, after sometime, he starts vomiting, What is the phenomenon responsible for such situation? Explain,
- Q6- Name any cell organelle which is non-membranous.
- Q7- If you are provided with some vegetables to cook, You generally add salt into the vegetables during cooking process. After adding salt vegetables release water. What mechanism is responsible for this?
- Q8- Write the name of different plant parts in which chromoplast, chloroplast and leucoplast are present.

ASSIGNMENT -3

Chemistry

Note- Revise All Syllabus of Science Done in note book Q1. What is the effect of humidity on evaporation ?

Q2. What is the effect of impurity

(i) On the melting point of a solid ?

(ii) On the boiling point of a liquid

Q3. What is the criterion of purity of a (i) Solid ?(ii) Liquid

Q4. What is the importance of boiling point of a substance ?

Q5. Ice floats over water , why ?

Q6. What is the significance of melting point of a substance ?

Q7. What are the difference between boiling and evaporation ?

Q8. Why surgeons often spray some ether on skin before performing minor surgery ?

Q9. Define latent heat of fusion of ice .

Q10. Match measurable quantities and their units .

Quantity	Unit
Temperature	Kilogram
Length	Newton
Mass	Kelvin
Weight	Cubic metre
Volume	Pascal
Density	Metre
Pressure	Kilogram per cubic metre

SOCIAL STUDIES

- Make Project files on given topics

1.Natural Vegetations

2. Disaster management

Make model on given topics:

Topics: 1 National monuments (Roll no.1 to 12)

2. Volcanoes model (Roll no 13 to 25)

3. Clay model of Mountain Ranges(Roll no. 26 to 35)

- Do the following map work on the Political Map of India.

States , capital and Union territories .

Map related with Ch.1,2, of Geography and ch.1 of history. (French Revolution)

Assignment:(learn and write)

1. Discuss the causes of the French revolution of 1789.

2 How would you explain the rise of Napoleon?

3 What was the role of Jacobins during the French revolution?

5 Explain the major features of democracy.

6." Democracy enhances the dignity of citizens."Explain.

6.Why do we prefer democracy to any other form of the government?

7.Distinguish between democratic and non democratic elections.

8. 'Democracy improves the quality of decision making '.Explain.

9.Describe the events that took place on 14th July 1789 in France.

10.Describe the steps taken to form the Constituent Assembly.

11.What is Preamble? State any two points of its importance.

12. What is a constitution? Explain the role of the Constitution for any country.

ARTIFICIAL INTELLIGENCE

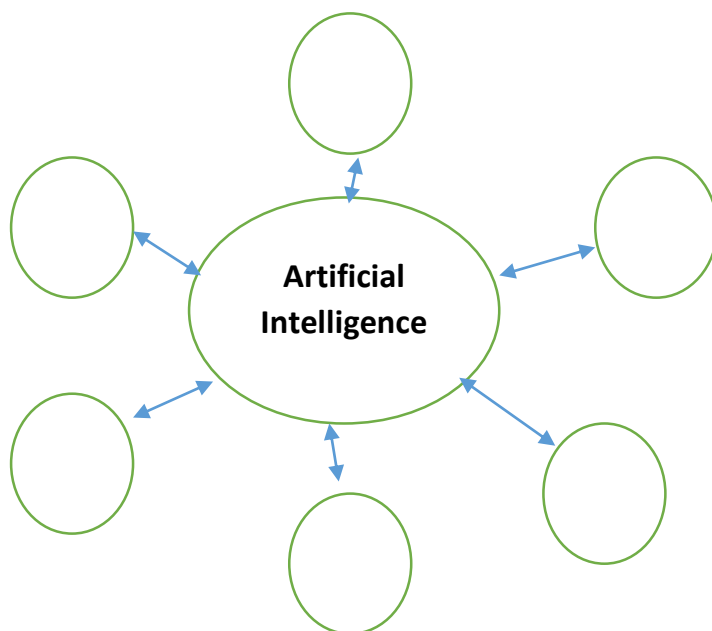
Note Learn all questions in your note book and book (unit 1)

AI is a form of intelligence; a type of technology and a field of study. AI theory and development of computer systems (both machines and software) are able to perform tasks that normally require human intelligence. Artificial Intelligence covers a broad range of domains and applications and is expected to impact every field in the future. Overall, its core idea is building machines and algorithms which are capable of performing computational tasks that would otherwise require human like brain functions Holiday's homework

Answer the following in your own words (write answer)

1. What do you think Artificial Intelligence is?
2. What do you want to learn about AI?
3. Can complex computer program copy human behaviour, which is often illogical and unpredictable ? Give reason to support your answer.
4. How do you think Artificial Intelligence can help you as you go about your daily life?

Fill in your ideas & Explain it below: (Do this on colored A4 sheet)



Maths

Assignment 1

CHAPTER - 2 (POLYNOMIALS)

Solve the following questions:

- Q1. $\sqrt{2}$ is a polynomial of degree
- a. 2 b. 0 c. 1 d. $\frac{1}{2}$
- Q2. If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$ is equal to :
- a. 0 b. 1 c. $4\sqrt{2}$ d. $8\sqrt{2} + 1$
- Q3. The value of the polynomial $5x - 4x^2 + 3$, when $x = -1$ is :
- a. -6 b. 6 c. 2 d. -2
- Q4. Zero of the polynomial $p(x) = 2x + 5$ is :
- a. $-\frac{2}{5}$ b. $-\frac{5}{2}$ c. $\frac{2}{5}$ d. $\frac{5}{2}$
- Q5. If $x + 1$ is a factor of the polynomial $2x^2 + kx$, then the value of k is :
- a. -3 b. 4 c. 2 d. -2
- Q6. $x + 1$ is a factor of the polynomial :
- a. $x^3 + x^2 - x + 1$ b. $x^3 + x^2 + x + 1$ c. $x^4 + x^3 + x^2 + 1$ d. $x^4 + 3x^3 + 3x^2 + x + 1$
- Q7. Which of the following is a factor of $(x + y)^3 - (x^3 + y^3)$?
- a. $x^2 + y^2 + 2xy$ b. $x^2 + y^2 - xy$ c. xy^2 d. $3xy$
- Q8. The coefficient of x in the expansion of $(x + 3)^3$ is :
- a. 1 b. 9 c. 18 d. 27
- Q9. If $\frac{x}{y} + \frac{y}{x} = -1$ ($x, y \neq 0$), the value of $x^3 - y^3$ is :
- a. 1 b. -1 c. 0 d. $\frac{1}{2}$

- Q10. If $x + y + 2 = 0$, then write the value of $x^3 + y^3 + 8$.
- Q11. Write the factors of polynomial $4x^2 + y^2 + 4xy + 8x + 4y + 4$.
- Q12. Find the coefficient of x^2 in $(x^2 - 2)^3$.
- Q13. Find the value of $249^2 - 248^2$.
- Q14. Find the value of 95×96 .
- Q15. Find the value of the polynomial $p(z) = 3z^2 - 4z + \sqrt{17}$, when $z = 3$.
- Q16. If -1 is a zero of the polynomial $p(x) = ax^3 - x^2 + x + 4$, find the value of a .
- Q17. Using factor theorem, show that $x - y$ is a factor of $x(y^2 - z^2) + y(z^2 - x^2) + (x^2 - y^2)$.
- Q18. Check whether $(p + 1)$ is a factor of $(p^{100} - 1)$ and $(p^{101} - 1)$.
- Q19. If $a + b + c = 7$ and $ab + bc + ca = 20$, find the value of $a^2 + b^2 + c^2$.
- Q20. Find the product of $(3x + 2y)(3x - 2y)(9x^2 + 4y^2)$.

Assignment -2

CHAPTER - 3 (COORDINATE GEOMETRY)

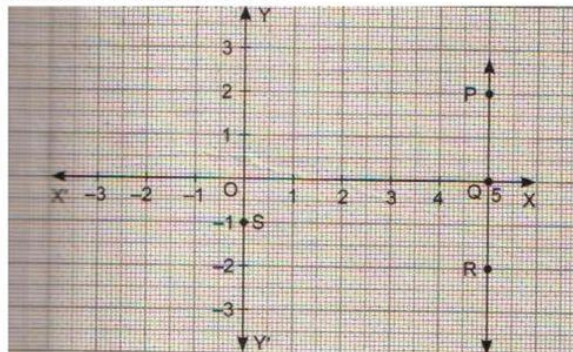
Solve the following questions:

- Q1.** Abscissa of all points on the x - axis is :
a. 0 b. 1 c. -1 d. none of these
- Q2.** A point both of whose coordinates are negative lies in the :
a. first quadrant b. second quadrant
c. third quadrant d. fourth quadrant
- Q3.** Which of the points P (0, 3), Q (1, 0), R (0, -1) and S(-5, 0), T (1, 2) do not lie on the x - axis?
a. P and Q only b. Q and S c. P, R and T d. Q, S and T
- Q4.** The coordinates of the point lying on the negative side of x - axis at a distance of 5 units from the origin are :
a. (0, 5) b. (0, -5) c. (5, 0) d. (-5, 0)
- Q5.** If the coordinates of two points are P(-2, 3) and Q (-3, 5), then (abscissa of P)-(abscissa of Q) is :
a. 1 b. -1 c. -2 d. -5
- Q6.** Signs of the abscissa and the ordinate of a point in the second quadrant are respectively :
a. +ve, +ve b. -ve, -ve c. -ve, +ve d. +ve, -ve
- Q7.** Ordinate of all points on the x - axis is :
a. 0 b. 1 c. 2 d. -1
- Q8.** The distance of the point (4, -3) from x - axis is :
a. -3 units b. 4 units c. 3 units d. 5 units
- Q9.** The point at which the two coordinate axes meet is called the :
a. abscissa b. origin c. ordinate d. quadrant
- Q10.** Points (1, -1), (2, -2), (4, -5), (-3, -4)
a. lie in II quadrant b. lie in III quadrant
c. lie in IV quadrant d. do not lie in the same quadrant
- Q11.** Write the abscissa of the point (-2, 7).
- Q12.** Write the co-ordinates of a point whose ordinate is -3 and which lies on y-axis.

MATHS/IX/ASGMT

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- Q13.** Find ordinate of all points on the x-axis.
- Q14.** Find the perpendicular distance of point P(3, 4) from x-axis.
- Q15.** If the points A(0, 2), B(0, -6) and C(a, 3) lie on y-axis, then find the value of a.
- Q16.** In the figure given below, PQ is a line parallel to the y-axis at a distance of 5 units from it. What are the coordinates of the points P, Q, R and S?



- Q17.** Write the co-ordinates of the point :
i. Whose ordinate is -5 and which lies on y-axis?
ii. Which lies on x and y axes both?
iii. Whose abscissa is -3 and which lies on x-axis?
- Q18.** Name the quadrants in which the following points lie:
(-5, -4), (2, -4), (-7, 6), (2, 3)
- Q19.** Which of the following points lie on x-axis? Which on y-axis?
A(0, 2), B(5, 6), C(-3, 0), D(0, -3), E(0, 4), F(6, 0), G(3, 0)
- Q20.** If $x > 0$ and $y > 0$, then the point (x, y) lies in which quadrants?

Assignment 3

CHAPTER - 1 (NUMBER SYSTEMS)

Solve the following questions:

- Q1.** The product of any two irrational numbers is :
- always an irrational number
 - always a rational number
 - always an integer
 - sometimes rational, sometimes irrational
- Q2.** Which of the following is not equal to $\left[\left(\frac{5}{6}\right)^{\frac{1}{5}}\right]^{\frac{1}{6}}$:
- $\left(\frac{5}{6}\right)^{\frac{1}{5 \cdot 6}}$
 - $\frac{1}{\left[\left(\frac{5}{6}\right)^{\frac{1}{5}}\right]^{\frac{1}{6}}}$
 - $\left(\frac{6}{5}\right)^{\frac{1}{30}}$
 - $\left(\frac{5}{6}\right)^{\frac{1}{30}}$
- Q3.** The number of rational numbers between $\sqrt{3}$ and $\sqrt{5}$ is :
- one
 - two
 - three
 - infinitely many
- Q4.** The arrangement of $\sqrt{5}, \sqrt{2}, \sqrt{3}$ in ascending order is :
- $\sqrt{2}, \sqrt{3}, \sqrt{5}$
 - $\sqrt{5}, \sqrt{3}, \sqrt{2}$
 - $\sqrt{2}, \sqrt{5}, \sqrt{3}$
 - $\sqrt{3}, \sqrt{2}, \sqrt{5}$
- Q5.** Value of $\sqrt[3]{(81)^{-2}}$ is :
- $\frac{1}{9}$
 - $\frac{1}{3}$
 - 9
 - $\frac{1}{81}$
- Q6.** The product $\sqrt[3]{2} \cdot \sqrt[4]{2} \cdot \sqrt[5]{32}$ equals :
- $\sqrt{2}$
 - 2
 - $\sqrt[5]{2}$
 - $\sqrt[3]{32}$
- Q7.** Value of $(256)^{0.16} \times (256)^{0.09}$ is :
- 4
 - 16
 - 64
 - 256.25
- Q8.** The decimal expansion of the number $\sqrt{2}$ is :
- a finite decimal
 - 1.41421
 - non-terminating recurring
 - non-terminating non-recurring
- Q9.** The number obtained on rationalising the denominator of $\frac{1}{\sqrt{7}-2}$ is :
- $\frac{\sqrt{7}+2}{3}$
 - $\frac{\sqrt{7}-2}{3}$
 - $\frac{\sqrt{7}+2}{5}$
 - $\frac{\sqrt{7}+2}{45}$

Q10. How many rational numbers are between two rational numbers?

Q11. Is every irrational or rational number a real number?

Q12. Write the value of 1.999... in the form $\frac{p}{q}$, where p, q are integers, $q \neq 0$.

Q13. Write the rationalising factor of $\frac{1}{\sqrt{7}-\sqrt{4}}$.

Q14. Find the value of $(81)^{0.16+0.09}$.

Q15. Find the value of $(256)^{0.16} \times (256)^{0.09}$

Q16. Evaluate: $\left(\frac{1}{2}\right)^5 \times \left(\frac{-2}{3}\right)^4 \times \left(\frac{3}{5}\right)^{-1}$

Q17. Simplify: $\sqrt[3]{81} - 8\sqrt[3]{216} + 15\sqrt{4} + \sqrt{225}$

Q18. Simplify: $\frac{1}{(2+\sqrt{5})} + \frac{1}{(\sqrt{5}+\sqrt{6})} + \frac{1}{(\sqrt{6}+\sqrt{7})} + \frac{1}{(\sqrt{7}+\sqrt{8})}$

Q19. Simplify: $\frac{7\sqrt{3}}{\sqrt{10+\sqrt{3}}} - \frac{2\sqrt{5}}{\sqrt{6+\sqrt{5}}} - \frac{3\sqrt{2}}{\sqrt{15+3\sqrt{2}}}$

Q20. If $a = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $b = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then find the value of $a^2 + b^2 - 5ab$.