Rukmani Birla Modern High School

Session 2026-27

SUMMER ASSIGNMENT

Dear Students,

Summer holidays bring thoughtful days,
Where learning blooms in gentle ways.
Do your assignments, spark your mind,
Read books too—new worlds you'll find.

Explore near and wide with purpose true,
Spend time with family, friends by you.
Help birds and strays with caring hands,
Kindness nurtures across the lands.

Return rejuvenated, relaxed, refreshed, revived, recharged,
Hearts aglow, with wisdom enlarged.
Summer's lessons, soft and slow,
Will help your knowledge to grow.

Complete your class-specific assignments mindfully during this enriching break.
Tasks follow on the next pages.
Submit on the first day back.

Happy Holidays

RUKMANI BIRLA MODERN HIGH SCHOOL
SESSION 2026-27
SUMMER ASSIGNMENT
CLASS X

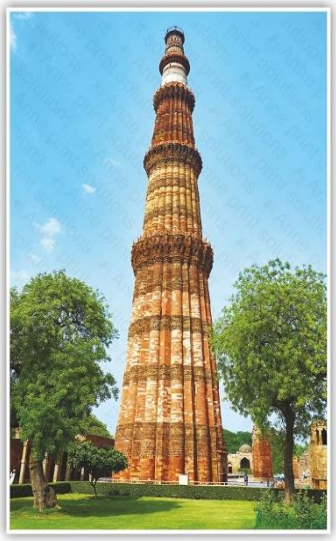
Subject	Assignment
English	Prepare a project on the topic given below: Topic: Freedom, Oppression and Dignity **Project Question:** How do the themes of freedom, oppression and dignity in Long Walk to Freedom by Nelson Mandela and A Tiger in the Zoo by Leslie Norris present contrasting yet interconnected perspectives on human and animal experiences? **Guidelines for the Assignment:** Present your work on A4 size sheets in a neat ,well organized and creative format, in your own handwriting. Ensure originality and thoughtful presentation COVER PAGE • Title • Student Name, Class, Roll Number • Session **PROJECT STRUCTURE** 1. Introduction Mention the key themes of: Freedom in Long Walk to Freedom Oppression in both texts Dignity in human and animal life 2. Thematic Analysis (Analytical Section) A. Oppression and Loss of Freedom Explain racial oppression in Mandela's life. Compare with the tiger's confinement in the zoo. Highlight physical vs psychological oppression. B. Dignity and Self-respect Mandela's dignity despite imprisonment. The tiger's silent strength and lost pride. Importance of dignity in all living beings. **Include:** Statistics or short newspaper clippings on: Human rights Animal rights Pictures, charts, or creative artwork **Reflections:** Highlight what you, as a student, learned personally from these texts and how they changed your perspective.
Mathematics	Prepare a model on any one of the following topics: Machine Learning Basics using Mathematics, Data Science and Mathematical Models, Coding and Mathematics in AI, AI and Coordinate Geometry, Trigonometry, Conic Sections, Algebra, Geometry Map Project, Optical Illusion, Tessellation, Probability,

Fractals, Three-Dimensional Geometry, Combination of Solid Figures, Spirograph, Sierpinski Triangle, Cartesian Plane, Vectors and Scalars Quantities in Real Life.

Case Based Questions

Do the following case study questions in Math Assignment register:

Q1. TOWER OF PISA: To prove that objects of different weights fall at the same rate, Galileo dropped two objects with different weights from the Leaning Tower of Pisa in Italy. The objects hit the ground at the same time. An object dropped off the top of Leaning Tower of Pisa falls vertically with constant acceleration. If s is the distance of the object above the ground (in feet) t seconds after its release, then s and t are related by an equation of the form $s = a + bt^2$ where a and b are constants. Suppose the object is 180 feet above the ground 1 second after its release and 132 feet above the ground 2 seconds after its release.



(i) Find the constants a and b.

(ii) How high is the Leaning Tower of Pisa?

(iii) How long does the object fall?

(iv) At t = 2 sec, the object is at what height?

Q2. Rainbow is an arch of colours that is visible in the sky after rain or when water droplets are present in the atmosphere. The colours of the rainbow are generally red, orange, yellow, green, blue, indigo and violet. Each colour of the rainbow makes a parabola. We know that any quadratic polynomial p(x) = a$x^2 + bx + c$, a ≠ 0 represents a parabola on the graph paper.

Based on the above, answer the following questions:

(i) The graph of y = f(x) is shown in the figure. Write the number of zeroes of the curve.

(ii) If the graph of a rainbow does not intersect the x-axis but intersects y-axis at one point, then how many zeroes will it have?

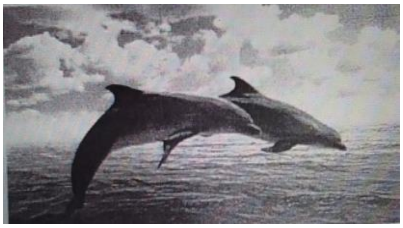
(iii) If a rainbow is represented by the quadratic polynomial

P(x)= $x^2 + (a+)x + b$, whose zeroes are 2 and –3, find the value of a and b.

OR

(iii) The polynomial = $x^2 - 2x + (7p + 3)$ represents a rainbow. If –4 is a zero of it, find the value of p.

Q3. In a pool at an aquarium, a dolphin jumps out of the water travelling at 20 cm per second. Its height above water level after t seconds is given by $h = 20t - 16t^2$



Based on the above information, answer the following questions:

(i) Find zeroes of polynomial $p(t) = 20t - 16t^2$.

(ii) Which of the following types of graph represents p(t)?

	(iii) What would be the value of h at t = 3/2? Interpret the result.
Science	**Worksheet 1** **<u>Subjective Problems</u>**: Q1.A convex mirror of radius of curvature 30cm forms an image that is half the size of the object. Find the object distance? Q2.If the distance between object and its two times magnified virtual image produced by a curved mirror is 15cm. Find the focal length of the mirror? Q3.An object is placed at a distance of 12cm in front of a plane mirror. The virtual and erect image is formed by the mirror. Now the mirror is moved by 4cm towards the stationary object. Find the distance by which the position of image would be shifted? Q4.When one light ray is reflected from a plane mirror with 30^0 angles of reflection. What will be the angle of deviation of the ray after reflection? Q5.Two objects A and B are placed at 15cm and 25cm from the pole in front of a concave mirror having radius of curvature 40cm. Calculate the distance between images formed by the mirror? Q6.Two plane mirrors are inclined at 70^0. A ray incident on one mirror at angle, θ after reflection falls on second mirror and is reflected from there parallel to first mirror. Find the value of θ? Q7.A rod of length 10cm lies along the principal axis of a concave mirror of focal length 10cm in such a way that its end closer to the pole is 20cm away from the mirror. Calculate the length of the image? Q8.Ravi often eats junk food and complains of fatigue. His doctor advises him to include green vegetables and fruits. Explain how a balanced diet helps in efficient digestion and absorption. What could be the consequence of not following it? Q9.Aerobic respiration requires intake of oxygen to breakdown food to release energy. • Name the structures through which gaseous exchange takes place in plants and human beings • Name the structure that controls the size of the chest cavity in humans to facilitate exchange of gases. • What is the process by which gas exchange occurs in plants? • Why is the process named in (c) not sufficient to carry oxygen throughout human body? How is this complemented in humans to ensure that oxygen is carried to all parts of the body? • Reactions in living systems can absorb heat or release heat. State whether the heat energy is absorbed/ released during digestion. Also write the scientific term to denote the same. Q10. A student observes that when a plant is watered regularly, its leaves remain fresh, but when not watered, they wilt. Relate this observation to the role of xylem in plants. Why does wilting occur? Q11. A person suffers from kidney failure and undergoes dialysis. Explain how dialysis helps in removing wastes. Compare this process with the normal function of kidneys.

Q12. Draw a diagram of the human heart showing arrows indicating blood flow. Which side carries oxygenated blood and explains why there is no mixing of oxygenated and deoxygenated blood.

Q13. Burning of fuels and respiration both release energy. Differentiate between respiration and combustion based on rate, control, and energy release. Why is respiration more suitable for living organisms

Q14. During a hot day, plants close their stomata. Explain how this helps the plant, and discuss one disadvantage of this process.

Q15. Rahul kept an iron nail in three different test tubes:

A: Nail + water + air

B: Nail + boiled water + oil layer

C: Nail + dry air (with calcium chloride)

After a few days, rust appeared only in test tube A. Explain why rusting occurred only in test tube A, name the type of reaction involved, and write the chemical equation for rusting.

Q16. A silver spoon becomes black after being kept unused for a long time. Explain why this happens, name the gas responsible for it, and write the chemical reaction involved in the process.

Q17. A student added copper sulphate solution to iron nails and observed a reddish-brown coating on the nails. Identify the coating formed, explain why the reaction occurred, and write the balanced chemical equation for the reaction.

Q18. When quicklime is mixed with water, the beaker becomes hot. Identify the type of reaction involved, explain why the beaker becomes hot, and write the chemical equation for the reaction.

Q19. Food packets are flushed with nitrogen gas before sealing. Explain why nitrogen is used, name the type of reaction that is prevented, and describe what happens when food gets oxidised.

Q20. Calcium carbonate is heated strongly. Name the products formed, identify the type of reaction involved, and write the balanced chemical equation for the reaction.

Q21. A gas released during a chemical reaction turns lime water milky. Identify the gas, name the compound responsible for the milky appearance, and write the chemical reaction with lime water.

Worksheet 2

Assertion-Reason Questions:

The following questions consist of two statements-Assertion (A) and Reason (R).Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the 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.

Q1.**Assertion (A):** The image formed by a plane mirror is erect and laterally inverted.
Reason (R): A plane mirror always forms a virtual image of the same size as the object.

	Q2.**Assertion (A):** When an object is moved 20 cm towards a concave mirror of focal length 15 cm from an initial distance of 40 cm, the image shifts 36 cm away from the mirror. **Reason (R):** For a concave mirror, as the object moves towards the focus from beyond the centre of curvature, the image formed moves farther away from the mirror with increasing magnification. Q3.**Assertion (A):** A concave mirror can form both real and virtual images depending on the position of the object. **Reason (R):** The image formed by a concave mirror is always inverted. Q4.**Assertion (A):** A concave mirror used as a shaving mirror should have a radius of curvature of 30 cm if the face is placed 10 cm from the mirror and the final image is formed at the least distance of distinct vision. **Reason (R):** For a shaving mirror, the image formed must be virtual, erect, and magnified, which is obtained when the object lies between the pole and focus of a concave mirror. Q5. **Assertion (A)** : The mirrors used in search lights are concave spherical. **Reason(R):** In concave spherical mirror the image formed is always virtual. Q6. **Assertion (A)** : For observing traffic at back, the driver mirror is convex mirror. **Reason (R):** A convex mirror has much larger field of view than a plane mirror. Q7. **Assertion (A)** : When the object moves with a velocity 2m/s, its image in the plane mirror moves with a velocity of 4m/s. **Reason(R):** The image formed by a plane mirror is far behind the mirror as object is in front of it. Q8. **Assertion (A):** The stomach does not digest carbohydrates significantly. **Reason (R):** The acidic medium in the stomach inactivates salivary amylase. Q9. **Assertion (A)**: Breathing rate increases after running. **Reason (R):** Lactic acid accumulates in muscles due to anaerobic respiration. Q10.**Assertion (A):** Xylem transport does not require energy. **Reason (R):** It occurs due to transpiration pull and root pressure. Q11.**Assertion (A):** There is no mixing of oxygenated and deoxygenated blood in humans. **Reason (R):** The heart has four chambers with complete separation. Q12.**Assertion (A):** Sweat is not considered an excretory product. **Reason (R):** It mainly helps in regulating body temperature. Q13. **Assertion (A):** Plants close stomata during the night. **Reason (R):** Photosynthesis does not occur in the absence of sunlight. Q14.**Assertion (A):** All living organisms need a continuous supply of energy. **Reason (R):** Energy is required for maintenance, growth, and repair processes. Q15.**Assertion (a):** Decomposition reactions are generally endothermic reactions. **Reason (R):** Decomposition of organic matter into compost is an exothermic process. Q16.**Assertion (a):** Silver chloride turns grey in sunlight. **Reason (R):** It decomposes into silver and chlorine in sunlight. Q17.**Assertion (A):** All exothermic reactions are accompanied with evolution of heat and light. **Reason (R):** Combination reactions may or may not be exothermic. Q18.**Assertion (A):** The reaction of quick lime with water is an exothermic reaction. **Reason (R):** Quicklime reacts vigorously with water releasing a large amount of heat. Q19.**Assertion (A):** In the following reaction $ZnO + C \rightarrow Zn + CO$, ZnO undergoes reduction. **Reason (R):** Carbon is a reducing agent that reduces ZnO to Zn. Q20.**Assertion (A**): The colour of aqueous solution of copper sulphate turns colourless when a piece of lead is added to it.

	Reason (R): Lead is more reactive than copper, and hence displaces copper from its salt solution. Q21.**Assertion (A):** Burning of natural gas is an endothermic process. **Reason (R):** Methane gas combines with oxygen to produce carbon dioxide and water.
Social Science	Sustainable Development Project (Compulsory) **Make a project on sustainable Development. (on any one topic)** 1. Use of solar energy and wind energy as a source of energy. 2. Efficient water fixtures. 3. Conservation strategies of Forest and Wild life. 4. Mineral conservation methods. 5. Role of Government and UNO in sustainable development. **Select any one or combination of topics and prepare the file covering the following topics:** • Cover page • Introduction • Objective of the study • Collage of pictures • Poem or Story about its usefulness • Suggestions that can be adopted Students will prepare an A4 size file containing 15-20 pages.
Hindi	**विज्ञापन लेखन** • पुस्तक प्रदर्शनी पर आकर्षक विज्ञापन तैयार कीजिए – **रचनात्मक कार्य** • 'स्वच्छ भारत अभियान' पर एक पोस्टर बनाइए। • वर्षा ऋतु पर एक कविता लिखिए।
Sanskrit	• गृहनिर्मितम् भोजनं स्वादिष्टं पौष्टिकम् , स्वास्थ्यवर्धकं च भवति।' अस्मिन् विषये संस्कृतभाषायां दशवाक्यानि लिखत। • श्रीमद्भगवद्गीता के बारहवें अध्याय से पहले दस श्लोक कंठस्थ कीजिए।
French	Read the novel Le Petit Prince by St. Exupery carefully and write character sketches of the main characters.
Artificial Intelligence	Write Python programs in AI Practical File. (File must be interleave, write output on left side blank page) 1. Write a program to calculate the surface area and volume of a cuboid. (Surface area= 2*(length * width + length * height + width * height), Volume = length * width * height) 2. Write a program to ask for height in centimeters and convert it into feet and inches. (height in inches = height in cm /2.54, height in feet = height in inches //12) 3. Write a program to calculate Simple Interest and Compound Interest. (SI = P *R*T/100) $CI = P(1 + \frac{R}{100})^T - P)$. 4. Write a program to calculate square and cube of any number. 5. Write a program to check whether the applicant is eligible to vote in the elections or not. Take age as input. 6. Write a program to check whether the entered number is positive and even, positive and odd, negative and even , or negative and odd.

	7. Write a program to check whether the given year is leap or not. 8. Write a program to print Multiplication table of any number using for loop. (Format should be – 5 X 1 = 5) 9. Write a program to print Factorial of any number using while loop. 10. Write a program to print sum of first 10 natural numbers using for loop.