GURUKUL INTERNATIONAL SCHOOL, Haldwani
HOME WORK FOR WINTER BREAK (2025-26)

Class - XI Science

ENGLISH-

1 If one character from your textbook could come alive in today's world, whom would you choose and why ?
2 An ode is a formal, lyrical poem that praises or glorifies a person, place, thing, or idea.
eg. Ode on an Grecian Urn by John Keats and Ode to the West Wind by P B Shelley.
Taking reference from these classic poems, compose an ode dedicated to your dear ones.
3 Imagine, the poet of a poem you studied visits your classroom. Write a short conversation between you and the poet.
4 Make a collection of 10 English idioms along with their meanings and write a short, creative story using these English idioms
5 Draw a colourful and informative poster on 'Cyber Crime and Digital Safety.'

MATHEMATICS-

1 If a, b, c are in G.P. and $a^{1/x} = b^{1/y} = c^{1/z}$, prove that x,y,z are in A.P.
2 Sum the series $3.8 + 6.11 + 9.14 + \ldots$ to n terms.
3 Find the equation of the perpendicular bisector of the line segment joining the points A (2, 3) and B (6, –5).
4 Find the equation of the line mid - way between the parallel lines $9x + 6y – 7 = 0$ and $3x + 2y + 6 = 0$.
5 Find the vertex, axis, focus, directrix, latus – rectum of the following parabola. Also draw their rough sketches
i) $4y^2 + 12x – 20y + 67 = 0$
ii) $x^2 + 2y - 3x + 5 = 0$
6 Find the equation of the circles which pass through the origin and cut off equal chords of length 'a' from the straight lines $y = x$ and $y = –x$.
7 Find equation of ellipse with focus at (1, 1) and eccentricity 1/2 and directrix $x – y + 3 = 0$.
8 If e and e' be eccentricities of hyperbole and its conjugate. Prove that $\frac{1}{e^2} + \frac{1}{e'^2} = 1$
9 Find equation of ellipse whose eccentricity is 1/2, the focus is (–1, 1) and diretrix $x – y + 3 = 0$.
10 Find equation of ellipse whose axis are along the coordinate axis, vertices are (±5, 0) foci (±4, 0).
11 Show that line joining (2, –3) & (–5, 1) is parallel to the line joining (7, –1) and (0, 3).
12 Find angle between x-axis and the line joining the points (3, –1) and (4, –2).
13 Make a model or project on conic section
i) Parabola b) Ellipse c) Hyperbola

PHYSICS-

1 The angle of contact of mercury with glass is obtuse, while that of water is acute. Why ?
2 Water can rise upto a height of 10 cm in a capillary. If a capillary of the same diameter but of length 8 cm is held vertically in water, will the water come out in the form of fountain ?
3 If a capillary tube in water in state of weightlessness, how will the rise of water in it be different to that observed in normal condition ?
4 A liquid is kept in a cylindrical vessel which is rotated about its axis. The liquid rises at the sides. If the radius of the vessel is 0.05 m and speed of rotation is 2 rev/sec, find the difference in the height of the liquid at the centre of the vessel and its sides.
5 A cylindrical 1m in radius rest on a platform 5m high. Initially the tank is filled with water to a height of 5 m. A plug whose area is 10^{-4}m² is removed from an orifice on the sides of the tank at the bottom. Calculate initial speed with which the water flows from the orifice, initial speed with which water strikes the ground.
6 Water stands at a height H in a tank whose side walls are vertical. A hole is made in one of the wall at a depth h below the water surface. Find at what distance from the foot of the wall does the emerging stream of water strike the floor and for what value of h this range is maximum.
7 Under isothermal condition two soap bubble of radii a and b coalesces to form a single bubble of radius c . If external pressure is p_0 find an expression for surface tension in terms of p_0, a b and c.
8 A body cools in 7 min from 600°C to 400°C. What will its temp in next 7 min? The temp of the surrounding is 100°C.
9 State the first law of thermodynamics. Apply it for adiabatic process, cyclic, isochoric, isobaric process. Hence establish the Mayer relation.
10 The pressure in a monoatomic gas increases linearly from 4×10^5 N/m² to 8×10^5 N/m² when its volume increases from 0.2 m³ to 0.5 m³. Calculate i) work done by the gas ii) increase in the internal energy iii) molar heat capacity of gas.
11 A tunnel is dug across the earth passing through the centre. If a body be dropped at one end of the tunnel, then prove that its time period will be same as that of a satellite revolving near the earth.

12 Obtain expressions for kinetic and potential energies of a body executing SHM. Prove that its total energy is proportional to the square of the amplitude of oscillation.

13 Derive the expression for orbital velocity of a satellite moving round the earth if earth has a mass M and radius R.

14 A body weight 63 N on the surface of the earth what is the gravitational force on it due to the earth at a height equal to the half radius of the earth ?

15 What is gravitational potential energy, find its expression ?

CHEMISTRY-

1 Draw Newman and Sawhorse projections for the eclipsed and staggered conformations of ethane. Which of these conformations is more stable and why?

2 Write the IUPAC name of all the structural isomerism formed by chloropentane.

3 Suggest method of purification used in following cases:-

a) The fragrance of flowers is due to the presence of some steam volatile organic compounds called essential oils. These are generally insoluble in water at room temperature but are miscible with water vapor in vapor phase. A suitable method used for extraction of these oils from the flower.

b) During hearing of a court case the judge suspected that some changes in the documents had been carried out. He asked the forensic department to check the ink used at two different places. According to you which technique can give the best results?

4 **Case based question.**

In some countries, ethanol is blended with petrol (gasoline) as a biofuel to reduce dependence on fossil fuels. A fuel mixture contains 10% ethanol (C_2H_5OH) and 90% petrol (approximated as octane, C_8H_{18}) by volume.

a) Write the balanced combustion equations for ethanol and octane.

b) How might the addition of ethanol affect the overall energy content (calorific value) of the fuel mixture compared to pure petrol? Explain briefly.

c) What is one environmental benefit of using ethanol-petrol blends?
(Some hints for you:-Calorific values: Ethanol ≈ 29.7 MJ/kg, Octane ≈ 44.4 MJ/kg)

5 Make an investigatory projects in any one of the following topics-

a) To study the acidity of different samples of the leaves.

b) To study the acidity of different samples of cold drinks available in market.

c) To study the analysis of fruit and vegetable juices for their acidity.

d) To study the methods of purification of water.

e) To study the importance of buffer in day to day life.

BIOLOGY-

1 Observe and describe how the study of chapters based on Human physiology helped you to understand the biology behind different changes and functions taking place in your body and answer the following questions with scientific biological reasoning in A4 sheet.

a) Why does urine output increases in winters and decreases in summers ?

b) Why your heart rate goes up when you are sick ?

c) Why does breathing rate increases during exercise?

d) Why do pupils dilate when you are scared ?

2 Draw a factory analogy diagram representing cell organelles as a factory in a A3 sheet (for example: Nucleus = Manager ,Mitochondria = Powerhouse, Ribosomes = Workers , ER & Golgi = Transport & Packaging units etc.)

• Label organelles clearly and write one biological function for each analogy.

3 Create a food plate collage showing: " Biomolecules in our food plate" such as Carbohydrates, Proteins, Fats, Vitamins & minerals, etc.

- Paste pictures of foods in a chart paper.
- Link each food item to the biomolecule present in it .
- Mention one biological role of each biomolecule.

4 **Case study: Do this case study in A4 sheet.**

Amit got a small cut on his finger while playing. After a few days, the wound healed completely. His teacher explained that damaged cells are replaced by new cells. This replacement occurs through a particular type of cell division.

Case based Questions:

a) Name the type of cell division involved in wound healing.

b) Which phase of the cell cycle prepares the cell for division?

c) Why is cell division important for living organisms?

d) What would happen if this process stopped.

PHYSICAL EDUCATION-

1 Explain the importance of Physical Education in the development of a student. Discuss its role in physical, mental, social, and emotional development.

2 Describe the concept of wellness and fitness. Explain the different components of physical fitness with examples.

3 What is yoga? Explain the importance of yoga in maintaining good health and describe any four asanas with their benefits.

4 Define balanced diet. Explain the major nutrients required by the body and their functions in detail.

5 Anyone one IOA recognised sports/Games of choice.Labelled diagram of field and equipment. Also,mention it's rules, terminologies and skills.

HINDI-

1 **स्थिति आधारित प्रश्न**

राजस्थान के एक गांव में कई वर्षों से वर्षा कम हो रही है तालाब और कुएं सूख चुके हैं। गांव के बुजुर्ग लोग पारंपरिक जल संचयन प्रणाली कुंई निर्माण का सुझाव देते हैं। लेकिन युवा पीढ़ी इसे कठिन मानकर असहमत है।

क) कुंई का निर्माण गांव के लिए लाभकारी कैसे हैं ?

ख) युवाओं की सोच में परिवर्तन लाने के लिए आप क्या सुझाव देंगे ?

2 शहर के किसी प्रतिष्ठित स्कूल के लिए हिंदी अध्यापक पद के लिए अपना एक आकर्षक स्ववृत्त तैयार कीजिए।

3 किसी ऐसी रोचक यात्रापर रचनात्मक लेख लिखिए जिससे आपको ऐतिहासिक व सांस्कृतिक ज्ञान प्राप्त हुआ हो।

4 आपके क्षेत्र में विधि व्यवस्था की स्थिति अत्यंत खराब हो चुकी है।आए दिन चोरी राहजनी की घटनाएं बढ़ती जा रही हैं । इसकी रोकथाम हेतु स्थानीय थानाध्यक्ष को पत्र लिखिए।

5 झारखंड और उत्तराखंड की संस्कृति का तुलनात्मक अध्ययन करते हुए एक परियोजना कार्य तैयार कीजिए।

मुख्य बिंदु–

- राज्य परिचय
- सांस्कृतिक पृष्ठभूमि
- भाषा और बोलियां
- लोक नृत्य लोक संगीत
- त्योहार और परंपराएं
- वेशभूषा और आभूषण
- कला शिल्प और आजीविका
- निष्कर्ष

COMPUTER–

1 **CASE STUDY – 1**

A school stores the marks of a student in five subjects using a Python list:

marks = [78, 65, 89, 72, 80]

i) Identify the data structure used.

ii) How many elements are present?

iii) Write a statement to display the first element.

iv) Write a statement to find the highest mark.

v) Write a statement to add 90 to the list.

CASE STUDY – 2

student = {"name":"Aarav", "class":"XI", "marks":82}

i) Identify the data structure.

ii) Write the key-value pair for marks.

iii) Display the student name.

iv) Update marks to 88.

v) Give one advantage of dictionary.

2 Answer the following questions

Predict the output:

```
data = [10,20,30]
data.append(40)
print(len(data))
```

3 Identify error and rewrite the correct code

```
info = {"name":"Riya","age":16}
print(info["class"])
```

4 State whether the following are Good Practice or Bad Practice:

a) Using different passwords for different accounts

b) Sharing personal photos publicly

c) Updating software regularly

d) Clicking unknown links

5 Explain how awareness of cyber safety helps students become responsible digital citizens.

6 A student stores passwords in a notebook.

- Identify the risk.
- Suggest a safer alternative.

PSYCHOLOGY-

1 **Poster/Visual Thinking Task (Choose ANY ONE)**

(No internet images allowed–only hand-drawn or self-designed)

Option A: "My Brain at Work" Poster

Create a poster explaining what happens in your mind from morning till night using psychological concepts. You must show atleast:

- One cognitive process
- One emotional experience

- One motivational factor
- One learning experience

OR

Option B: Psychology Awareness Poster

Make a poster on "Why understanding psychology is important for students today"
Include:
Three psychological problems faced by students
One misconception people have about these problems

2 **Conceptual Mind Map**

Create a detailed hand-drawn mind map of ALLEIGHTchapters you have studied in the Class XI Psychology textbook.
For each chapter, your mind map must include:

- Main themes/core ideas
- Key concepts or terms

3 **Day Self-Reflection Diary**

Maintain a diary for 7 consecutive days and record the following daily:

- Mood (morning & evening)
- Study hours
- Sleep duration
- One emotionally significant event

After 7 days, write a reflection answering:

a) What pattern did you notice ?
b) Which psychological concepts explain your pattern ? What would you like to change and why ?

4 You notice that a student works extremely hard but feels never satisfied with their performance, even after success.

a) Identify two possible psychological reasons behind this behaviour.
b) Explain how motivation or self-concept may be involved.
c) As a psychology student, what advice would you give—and why?

5 Choose one behaviour that you observe frequently among students (e.g., procrastination, fear of failure, social withdrawal, over-dependence on phone). Answer the following:

a) Why do you think this behaviour exists ?
b) Which psychological processes are involved ?
c) How would you study this behaviour scientifically if given a chance?
d) What difficulty might you face while studying it ? (No surveys required)

6 **Reflection based question**

Imagine you are a student psychologist observing yourself.

a) Identify one personal habit you want to understand better.
b) Explain it using atleast two psychological concepts.
c) Write one insight that changed how you see your self after studying psychology.