

PM SHRI KENDRIYA VIDYALAYA NO. 1 SAMBALPUR

HOLIDAY HOMEWORK (AUTUMN BREAK)

CLASS XI

ENGLISH CORE (301)

1. Revise all the lessons taught so far
2. Write the following in your English Notebook.
 - i) 5 Advertisements
 - ii) 3 Speeches
 - ii) 3 Posters
 - iv) 3 debates
3. Prepare one project Report on any ONE of the suggested topics given below:

Autumn Break Project Assignment

As part of the Autumn Break Holiday Homework, students of Class XI are required to complete a project on **one of the suggested topics** given below. The topics are based on the prescribed Class XI English texts and are designed to develop students' research skills, critical thinking, analytical writing, creativity and communication skills.

Students must complete the project during the autumn break and submit the project portfolio/report when the Vidyalyaya reopens.

Instructions for Preparing the Project Report

The project portfolio/project report must include the following components:

1. **Cover Page:** Title of the project, school name, class, subject and details of the student.
2. **Statement of Purpose / Objectives / Goals:** Clearly state the purpose and objectives of the project.
3. **Certificate of Completion:** A certificate stating that the project has been completed by the student under the guidance of the subject teacher.
4. **Action Plan:** Describe the step-by-step plan followed to complete the project.
5. **Relevant Photographs and Supporting Materials:** Include appropriate photographs, illustrations, newspaper clippings, charts, survey findings or other relevant materials.
6. **Essay / Report:** Prepare an analytical essay or report of **800-1,000 words** on the selected topic.
7. **Student Reflection:** Describe what you learnt, the challenges you faced and the insights gained during the project.

8. **List of Resources / Bibliography:** Mention the books, articles, reports, websites and other sources consulted while preparing the project.

General Guidelines

- Choose **one topic** from the list suggested below, as assigned or approved by the subject teacher.
- Use authentic and reliable sources of information.
- Present information in your own words and avoid copying content directly from websites or other sources.
- Connect the ideas explored in the project with the prescribed literary text.
- Analyse the information collected and draw meaningful conclusions.
- Maintain neatness, originality, proper organisation and grammatical accuracy.
- Include relevant visuals and supporting materials wherever appropriate.
- Be prepared to present and explain your project before the subject teacher.

Suggested Project Topics

1. **Ageing, Love and Companionship: The Changing Bond Between Generations**

Text connection: The Portrait of a Lady

2. **Memories, Loss and the Passage of Time: How Photographs Preserve Our Past**

Text connection: A Photograph

3. **Honesty, Integrity and Moral Values in a World of Temptations**

Text connection: The Summer of the Beautiful White Horse

4. **Nature and the Cycle of Life: The Beauty of Change and Renewal**

Text connection: The Laburnum Top

5. **The Trauma of Partition: Displacement, Loss and the Pain of Memories**

Text connection: The Address

6. **Courage, Teamwork and the Power of Positive Thinking in Times of Crisis**

Text connection: We're Not Afraid to Die... if We Can All Be Together

7. **Discovering the Past: How Archaeology and Modern Science Reveal History**

Text connection: Discovering Tut: The Saga Continues

8. **The Voice of Nature: Understanding the Water Cycle and the Importance of Environmental Conservation**

Text connection: The Voice of the Rain

9. **Gender Equality and Shared Responsibilities: Building a Respectful Family and Society**

Text connection: Mother's Day

10. **Science, Technology and Human Imagination: How New Discoveries Change Our Understanding of the World**

Text connection: The Adventure

11. **Childhood and the Search for Identity: Understanding the Journey from Innocence to Maturity**

Text connection: Childhood

12. The Importance of Family Values in a Changing Society

Text connection: The Portrait of a Lady

13. Environmental Awareness and Biodiversity: Why Protecting Nature Is Essential for Our Future

Text connection: The Laburnum Top and The Voice of the Rain

14. The Human Cost of War and Political Conflict: Displacement, Belonging and the Search for Home

Text connection: The Address

15. Resilience in Adversity: How Determination and Cooperation Help People Overcome Challenges

Text connection: We're Not Afraid to Die... if We Can All Be Together

Submission Instructions

- The project must be submitted in a neat, properly organised portfolio or project file.
- The report should be original and written in clear, grammatically correct English.
- All sources of information must be acknowledged in the bibliography.
- Students should ensure that the project is complete in all respects before submission.
- The project must be submitted to the subject teacher on the date announced by the Vidyalaya after the autumn break.

Best wishes for a productive and enriching autumn break!

Read, explore, reflect and express your ideas with originality.

पीएम श्री केंद्रीय विद्यालय क्रमांक 1संबलपुर

शरदकालीन गृह कार्य

कक्षा -11

विषय – हिन्दी

नोट – परियोजना कार्य A4 साइज पेपर में करें लगभग 20 पेज।

प्रश्न 1 पाठ्य पुस्तक 'आरोह' में दिये हुए, कवि एवं लेखकों तथा उनकी रचनाओं से संबंधित परियोजना कार्य लगभग 20 पेज में कीजिए।

प्रश्न 2 पाठ्य पुस्तक 'अभिव्यक्ति और माध्यम' में से 50 प्रश्न लघु उत्तरात्मक बनाकर उत्तर लिखिए ।

प्रश्न 3 शरदकालीन अवकाश में आप कहां-कहां घूमने गए,अपने अभिभावकों से जानकारी इकट्ठा कर रचनात्मक लेख लिखिए।

प्रश्न 4 औपचारिक एवं अनौपचारिक दोनों पत्र लिखिए।

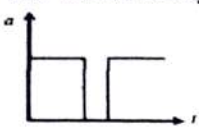
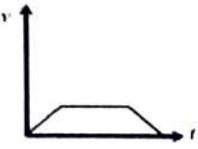
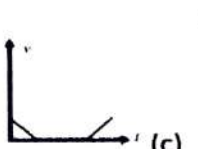
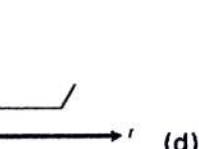
प्रश्न 5 स्ववृत्त का प्रारूप लिखिए।

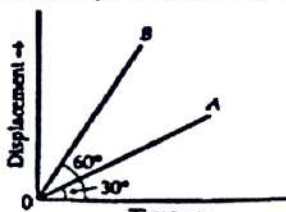
KENDRIYA VIDYALAYA SANGATHAN, BHUBANESWAR
HALF YEARLY EXAMINATION:2025-26
CLASS – XI SUBJECT – PHYSICS (042)
Time: 3-hour Max.Marks: 70

General Instructions:

- (i) There are 33 questions in all. All questions are compulsory.
- (ii) This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
- (iii) Section A contains sixteen questions, twelve MCQ and four Assertion-Reasoning based of 1 mark each, Section B contains five questions of two marks each, Section C contains seven questions of three marks each, section D contains two case study based questions of 4 marks each and Section E contains three long answer questions of five marks each
- (iv) There is no overall choice. However, an internal choice has been provided in two questions of section B, 3 question of section C, one question in each CBQ of section D and in all three questions of section E. You have to attempt only one of the choices in such questions.
- (v) Use of calculator is not allowed

Q.NO	QUESTION	MARKS
1	A student measured the diameter of a solid sphere using a Vernier Caliper of least count 0.01 cm and listed some measurements. The most correct measurement is (a) 5.3 cm (b) 5.32 cm (c) 5.320 cm (d) 5.3200 cm	1
2	The SI unit of Angular momentum is - (a) Kg m s^{-1} (b) $\text{N m}^{-1} \text{s}$ (c) $\text{N m}^2 \text{kg}^{-2}$ (d) Kg m s	1
3	In uniform circular motion (a) Both velocity and acceleration are constant (b) Velocity change and acceleration is constant (c) Both velocity and acceleration change (d) Velocity is constant and acceleration changes	1
4	A cyclist is moving with a velocity v turns a circular path of radius r . His inclination with the vertical is given by (a) $\tan \theta = v^2/rg$ (b) $\tan \theta = v^2g/r$ (c) $\tan \theta = v^2rg$ (d) none of the above	1
5	A body is initially at rest. It undergoes one dimensional motion with constant acceleration. The power delivered to it at time t is proportional to: (a) $t^{1/2}$ (b) t (c) $t^{3/2}$ (d) t^2	1
6	A car moving in a straight line at 30 ms^{-1} slows uniformly to a speed of 10 ms^{-1} in 5 second. Find the acceleration of the car (a) 2 ms^{-2} (b) 4 ms^{-2} (c) -2 ms^{-2} (d) -4 ms^{-2}	1
7	What is the ratio of gravitational force of attraction between two bodies kept in air and the same distance apart in water? (Refractive Index water=1.33 and air =1) (a) 1:1 (b) 1:2 (c) 2:1 (d) 3:1	1
8	According to Hooke's law of elasticity, if stress is increased, the ratio of stress to strain (a) Remains constant (b) Decrease (c) Increase (d) Becomes zero	1
9	A man is sitting on a rotating stool with his arms outstretched. Suddenly he stretched his arms. The angular velocity (a) decreases (b) increases (c) becomes zero (d) remains constant	1

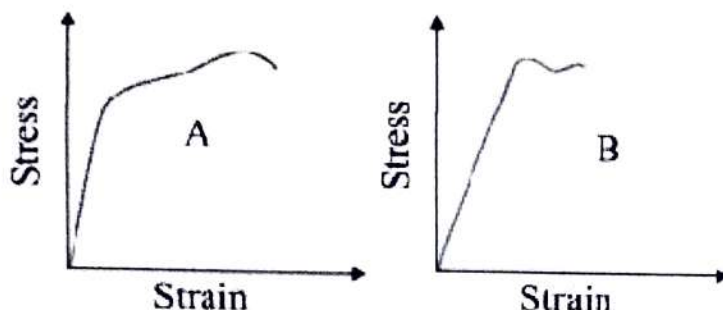
10	The length of the sum of the vectors $A=3\hat{i}$ and $B=4\hat{j}$ is a. 3 b. 4 c. 5 d. 6	1
11	Acceleration-time graph of a body is shown. The corresponding velocity-time graph of the same body is  (a)  (b)  (c)  (d) 	1
12	The clock A consist of Oscillation of spring, B consists of oscillation of pendulum, C consists of Digital circuits, D consists of small pulley system and spring. Out of these four which one you cannot use in space shuttle in space: a) A b) C c) D d) B	1
For Questions 13 to 16, two statements are given –one labelled Assertion (A) and other labelled Reason (R). Select the correct answer to these questions from the options as given below. (a) If both Assertion and Reason are true and Reason is correct explanation of Assertion. (b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion. (c) If Assertion is true but Reason is false. (d) If both Assertion and Reason are false.		
13	Assertion (A): Limiting friction is the minimum value of static friction. Reason (R): Kinetic friction is always greater than limiting friction.	1
14	Assertion: A spring has potential energy, both when it is compressed or stretched. Reason: In compressing or stretching, work is done on the spring against the restoring force.	1
15	Assertion: The position of center of mass of body depends upon shape and size of the body. Reason: Centre of mass of a body lies always at the center of the body .	1
16	ASSERTION: If there were no gravitational force, the path of the projected body always is a straight line. REASON: Gravitational force makes the path of projected body always parabolic.	1
SECTION-B		
17	Check whether this equation is dimensionally correct. $\frac{1}{2}mv^2 = mgh$ where m is the mass of the body, v its velocity, g is the acceleration due to gravity and h is the height. OR If force (F), length (L) & time (T) are assumed to be fundamental units, then find out the dimensional formula of the mass?	2
18	A body of mass 0.5 kg travels in a straight line with velocity $v=ax^{3/2}$ where $a=5\text{ m}^{-1/2}\text{ s}^{-1}$. What is the work done by the net force during its displacement from $x=0$ to $x=2\text{ m}$?.	2

19	Draw Stress- Strain curve for a metallic wire and level it with appropriate terms. OR Define elastic potential energy of a stretched wire. Derive expression for elastic potential energy of a stretched wire of length l.	2
20	In the HCl molecule, the separation between the nuclei of the two atoms is about $1.27 \text{ \AA}$ ($1 \text{ \AA} = 10^{-10} \text{ m}$). Find the approximate location of the CM of the molecule, given that a chlorine atom is about 35.5 times as massive as a hydrogen atom and nearly all the mass of an atom is concentrated in its nucleus.	2
21	A body weighs 63 N on the surface of the earth. What is the gravitational force on it due to the earth at a height equal to half the radius of the earth ?	2
SECTION-C		
22	Find the dimension of a, b & a/b in the relation $F = a\sqrt{x} + bt^2$ where F is force, x is distance & t is time interval.	3
23	Derive kinematic equations (i) velocity – time relation and (ii) displacement – time relation, by using v-t graph for uniformly accelerated motion of a particle. OR Two straight lines drawn on the same displacement time graph makes angle 30° and 60° with time axis respectively as shown in the figure which line represents greater velocity what is the ratio of the two velocities What is the nature of motion represented by each line? 	3
24	While a body moves in a circular path, it experiences an inward acceleration. What is this acceleration called? Derive its mathematical expression. OR A projectile can have the same range R for two angles of projection. If t_1 & t_2 be the time of flight in the two cases then prove that $t_1 \cdot t_2 = 2R/g$	3
25	Define impulse. Write its unit. A batsman hits back a ball straight in the direction of the bowler without changing its initial speed of 12 m s^{-1}. If the mass of the ball is 0.15 kg, determine the impulse imparted to the ball. (Assume linear motion of the ball)	3
26	Write the relation between torque and angular momentum. State and explain with an example the law of conservation of angular momentum	3
27	A man of mass 70 kg stands on a weighing scale in a lift which is moving (a) upwards with a uniform speed of 10 m s^{-1}, (b) downwards with a uniform acceleration of 5 m s^{-2}. (c) upwards with a uniform acceleration of 5 m s^{-2}. What would be the readings on the scale in each case?	3
28	A steel wire of length 4.7 m and cross-sectional area $3.0 \times 10^{-5} \text{ m}^2$ stretches by the same amount as a copper wire of length 3.5 m and cross-sectional area of 4.0×10^{-5}	3

m^2 under a given load. What is the ratio of the Young's modulus of steel to that of copper?

OR

The stress-strain graphs for materials A and B are shown



The graphs are drawn to the same scale.

- Which of the materials has the greater Young's modulus?
- Which of the two is the stronger material?
- The Young's modulus of rubber is greater than that of steel. Why?

SECTION-D

29

Early in our lives, we become aware of the tendency of all material objects to be attracted to the earth. Anything thrown up falls down towards the earth, going uphill is lot more tiring than going downhill, raindrops from the clouds above fall towards the earth and there are many other such phenomena. Historically it was the Italian Physicist Galileo (1564-1642) who recognized the fact that all bodies, irrespective of their masses, are accelerated towards the earth with a constant acceleration. It is said that he made a public demonstration of this fact.



To find the truth, he certainly did experiments with bodies rolling down inclined planes and arrived at a value of the acceleration due to gravity which is close to the more accurate value obtained later.

Q(i). Which of the following factors causes the acceleration due to gravity to be slightly weaker at the equator compared to the poles?

- Earth's shape (oblate spheroid)
- Earth's rotation
- Altitude above sea level
- Both A and B

Q(ii). At which location will the acceleration due to gravity be the least on Earth?

- At the North Pole
- At the South Pole
- At sea level at the equator
- At the summit of Mount Everest.

Q(iii). Which of the following is NOT a factor that directly influences the acceleration due to gravity?

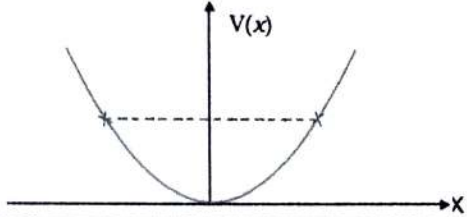
- The mass of the object
- The altitude above Earth's surface
- The Earth's radius
- The latitude of the location

1

1

1

	Q(iv). Does the gravitational force between two particles depends upon the medium between them? OR Q(v). How does the acceleration due to gravity vary vertically downward from the earth's surface?	1
30	Consider an isolated system of n interacting particles. The mutual forces between pairs of particles in the system cause changes in momenta of the individual particles. By third law, the mutual forces between any pair of particles are equal and opposite. By second law, the change in momenta for any pair of particles are Ft and $-Ft$. Thus, the momentum changes cancel in pairs and total momentum of the system remains constant. This leads to a fundamental principle of physics called the law of conservation of linear momentum. This law states that the total linear momentum of an isolated system of interacting particles is conserved. Therecoil of a gun on firing, explosion of a bomb into different fragments due to internal forces, the working of rockets and jet planes, etc.; can be explained on basis of momentum conservation. 1. A body of mass M moving with velocity V explodes into two equal parts. If one comes to rest and the other part moves with velocity v, what would be the value of v? A) V B) $V/\sqrt{2}$ C) $4V$ D) $2V$ 2. A bullet is fired from a rifle. If the rifle recoils freely, then the kinetic energy of the rifle is a) less than that of the bullet b) more than that of the bullet c) same as that of the bullet d) equal to or less than that of the bullet. 3. The explosion of a bomb into different fragments due to internal forces can be explained by A) First law of motion B) second law of motion C) law of conservation of momentum D) none of the above. 4. conservation of linear momentum is a consequence of A) 1st law and 2nd law B) 2nd law and 3rd law C) 1st law and 2nd law D) none of the above. OR 5. A body of mass 0.25 kg is projected with muzzle velocity 100 m/s from a tank of mass 100 kg. What is the recoil velocity of the tank? (A) 5 m/s B) 25 m/s (C) 0.5 m/s (D) 0.25 m/s.	1 1 1 1 1 1
	SECTION-E	
31	(a) Define projectile. A projectile is fired with velocity u making an angle θ with the horizontal. Show that its trajectory is a parabola. (b) A cricket ball is thrown at a speed of 28 m s^{-1} in a direction 30° above the horizontal. Calculate (a) the maximum height, (b) the time taken by the ball to return to the same level. OR Two vectors A and B are inclined to each other at an angle θ. Using parallelogram law of vector addition, find the magnitude and direction of their resultant. Calculate the magnitude and gives direction of R when (a) A and B act along the same straight line in the same direction. (b) A and B act along the same straight line but in opposite directions.	3+2 2+3

	(c) A^* and B^* are perpendicular to each other.	
32	(a) Prove that in an elastic one-dimensional collision between two bodies, the relative velocity of approach before collision is equal to the relative velocity of separation after the collision. (b) Derive an expression for work-energy theorem for a constant force OR a. A pump on the ground floor of a building can pump up water to fill a tank of volume 30 m^3 in 15 min. If the tank is 40 m above the ground, and the efficiency of the pump is 30%, how much electric power is consumed by the pump? b. The potential energy function for a particle executing linear simple harmonic motion is given by $V(x) = kx^2/2$, where k is the force constant of the oscillator. For $k = 0.5 \text{ N m}^{-1}$, the graph of $V(x)$ versus x is shown in Fig. Show that a particle of total energy 1 J moving under this potential must 'turn back' when it reaches $x = \pm 2 \text{ m}$. 	3+2 3+2
33	(a) Derive an expression for the escape speed of a body from the surface of the earth and show that it does not depend on the mass of projected body. (b) Derive expression for acceleration due to gravity near to the surface of earth. OR (a) Derive an expression for the orbital velocity of a satellite. Write its relation with escape velocity. (b) What is the rotational analogue of mass in rotational motion of body. Define it. Write the factors on which it depends.	3+2 3+2

PM SHRI KENDRIYA VIDYALAYA NO-1 SAMBALPUR
HALF YEARLY EXAMINATION-2025-26

PHYSICS
CLASS – XI

Time allowed: 3 hours

Maximum Marks: 70

General Instructions:

- (i) This question paper contains 33 questions. All questions are compulsory.
- (ii) This question paper has five sections: Section A, B, C, D and E.
- (iii) In Section A- Questions no. 1 to 16 are Multiple Choice type questions. Each question carries 1 mark .
- (iv) In Section B- Questions no. 17 to 21 are Very Short Answer type questions. Each question carries 2 mark .
- (v) In Section C-Questions no. 22 to 28 are Short Answer type questions. Each question carries 3 marks .
- (vi) In section D-Questions no. 29 and 30 are case study-based questions. Each question carries 4 marks .
- (vii) In section E- Questions no-31 to 33 are long Answer type questions. Each question carries 5 marks .
- (viii) There is no overall choice. However, an internal choice has been provided in few questions in all sections except Section A.
- (ix) Use of calculator is not allowed.

QN	SECTION-A	MM
1	In an experiment, the angle are required to be measured using an instrument, 29 divisions of the main scale exactly coincide with the 30 divisions of the vernier scale. If the smallest division of the main scale is half-a-degree then the least count of the instrument is: (A) one degree (B) half degree (C) one minute (D) half minute	1
2	A particle experiences constant acceleration for 20 seconds after starting from rest. It travels a distance S_1 in the first 10seconds and distance S_2 in the next 10seconds. Then (A) $S_2 = 3S_1$ (B) $S_2 = 2S_1$ (C) $S_2 = S_1$ (D) $S_2 = 4S_1$	1
3	Two blocks A and B of masses 2Kg and 1Kg rest a frictionless surface in contact. A force of 3N acts on A , then the force exerted by A on B is: (A) 1N (B) 2N (C) 3N (D) zero	1
4	During inelastic collision between two bodies, which of the following conserved: (A) Total Kinetic Energy (B) Total Mechanical energy (C) Total linear momentum (D) Speed of each body	1
5	A boy can throw a stone up to a maximum height of 10m. The maximum horizontal distance that the boy can throw the same stone up to will be: (A) $20\sqrt{2}m$ (B) 10m (C) $10\sqrt{2}m$ (D) 20m	1
6	The minimum number of unequal coplanar forces acting on a body so that it is in	1

	translational equilibrium is (A) 2 (C) 3	(B) 4 (D) none of these	
7	If A and B are non zero vectors , such that $ A + B = A - B $ then the angle between the two vectors will be (A) 45° (C) 75°	(B) 60° (D) 90°	1
8	If Earth suddenly shrinks to $1/8^{\text{th}}$ of its initial volume then the time period of Earth around own axis is (keeping mass constant) (A) 3 hours (C) 6 hours	(B) 1.5 hours (D) 24 hours	1
9	In rotational motion of a rigid body, all particles move with (A) Same linear and angular velocity. (B) Same linear and different angular velocity (C) With different linear velocities and same angular velocity. (D) With different linear velocities and different angular velocities.		1
10	The radii of circular orbits of two satellites A and B of the earth, are $4R$ and R , respectively. If the speed satellite A is $3v$, then the speed of the satellite B will be (A) $3v/2$ (C) $12v$	(B) $6v$ (D) $3v/2$	1
11	Two bodies of mass m and $9m$ are placed at a distance R . The gravitational potential on the line joining the bodies where the gravitational field equals zero, will be (G = gravitational constant) (A) $-\frac{16Gm}{R}$ (C) $-\frac{8Gm}{R}$	(B) $-\frac{20Gm}{R}$ (D) $-\frac{12Gm}{R}$	1
12	A force $F = 20 + 10y$ acts on a particle in y -direction where F is in newton and y in meter. Work done by this force to move the particle from $y=0$ to $y=1\text{m}$ is (A) 20J (C) 5J	(B) 30J (D) 25J	1
	For Questions 13 to 16 , two statements are given one labelled Assertion(A) and other labelled reason(R). Select the correct answer to these questions from options as given below. (A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion. (B) Both Assertion and Reason are true and Reason is not the correct explanation of Assertion. (C) Assertion is true but Reason is false. (D) Both Assertion and Reason are false.		
13	Assertion(A): For angular projection, when angle of projection $\theta = \tan^{-1}(1)$, the horizontal range is four times the maximum height. Reason(R): The horizontal range of projectile is directly proportional to square of velocity and inversely proportional to acceleration due to gravity.		
14	Assertion(A) : Pulling a lawn roller is easier than pushing it. Reason(R): Pushing increases the apparent weight and hence the force of friction.		
15	Assertion(A): In case of bullet fired from gun, the ratio of kinetic energy of gun and the bullet is equal to ratio of mass of bullet and gun.		

	Reason(R): In firing, momentum is conserved.	
16	Assertion(A): A judo fighter in order to throw his opponent on to the mat tries to initially bend his opponent and rotate him around his hip. Reason(R): As the mass of the opponent is brought closer to the fighter's hip, the force required to throw the opponent is reduced.	
	SECTION-B	
19	The length, breadth and thickness of a rectangular sheet of metal are 4.250m, 1.500m and 2.01cm respectively. Find its surface area and volume to correct significant figures.	2
20(I)	A particle is projected upward with velocity 60m/s. ($g=10 \text{ m/s}^2$) Find (a) average velocity of the particle in 8 seconds. (b) average speed of the particle in 8 seconds. OR	2
20(II)	An object thrown vertically upward and return to throwers hand. Draw its position(x)-time(t) and velocity(v)-time(t) graph.	2
21(I)	A body of mass 2Kg moving on a plane rough surface of coefficient of friction 0.4. Calculate the amount of force applied on the body parallel to the surface to produce an acceleration of 2m/s^2 . ($g=10\text{m/s}^2$) OR	2
21(II)	Two balls of equal momentum hit a wall. One sticks to the wall and rebounds. Which of them exerts greater force on the wall? Explain your answer.	2
22	A circular disc of radius R is removed from a bigger circular disc of radius 2R, such that the circumference of the discs coincides. Find the centre of mass of the new disc.	2
23	State Kepler's laws of planetary motion. Which law is the consequence of the conservation of angular momentum.	2
	SECTION-C	
24	(a) Write the dimensional formula of universal gravitational constant and universal gas constant. (b) If linear momentum(P), area(A) and time (T) are taken to be fundamental quantities, write the dimensional formula of energy.	3
25	A body has initial velocity 'u' and moving with constant acceleration 'a' along a straight line. Derive $S = ut + \frac{1}{2}at^2$ using velocity-time graph.	3
26	(a) A particle has initial velocity 6i m/s and acceleration $(2\text{i} + 4\text{j}) \text{ m/s}^2$. At what time its Y-component is 8m. What is the x-component at that time. Calculate the speed and direction of velocity at that time. (b) A body is moving with a speed of 3m/s along North. Constant acceleration of 0.5m/s^2 is acting along east. Calculate its speed after 8seconds.	3
27(I)	State work-energy theorem. Derive it for variable force. OR	3
27(II)	Define potential energy. Derive an expression for potential energy stored in spring of spring constant(k) when extended by 'x'.	3
28	(a) State Second law of rotational motion. (b) Calculate the torque if force of $(2\text{i} - \text{j} + \text{k})\text{N}$ acting at a point of position vector $(\text{i} + 2\text{j} - \text{k})\text{m}$	3
29	(a) At what height from the surface of Earth acceleration due to gravity becomes	3

	25% of its value on the surface of Earth? (Radius of earth is 6400Km) (b) Draw the variation 'g' with distance 'x' from the centre of earth.	
30	Define escape speed. Derive an expression for escape speed of a planet having mass M and radius R.	3
	SECTION-D	
31	Moment of inertia of a body about given axis represented by $I = MK^2$, where M is mass of the body and K is the radius of gyration of the body about the axis. When a body rotates about a given axis of rotation also moves, then the total K.E. of body = K.E. of translation + kinetic energy of rotation. Based on the above information answer the followings (i) The moment of inertia of a body depends on (A) mass of the body (B) shape and size of the body (C) axis of rotation of the body (D) All the above (ii) A 40Kg flywheel in the form of a uniform circular disc of diameter 1m is making 120rpm. The moment of inertia about an axis through centre of mass is (A) 20kgm^2 (B) 5kgm^2 (C) 10Kgm^2 (D) 25Kgm^2 (iii) The radius of gyration of a uniform rod of length 4m and mass 500gm about an axis through centre of mass is (A) 4m (B) $\frac{8}{3}\text{m}$ (C) $\frac{4}{\sqrt{3}}\text{m}$ (D) $\frac{2}{\sqrt{3}}\text{m}$ (iv) A solid sphere of mass 200gm rolls without slipping on a plane surface so that its centre of mass moves with velocity 2m/s. Its total kinetic energy is: (A) 0.4J (B) 0.56J (C) 0.16J (D) 5.6J	4
32	FREE BODY DIAGRAM: If a connected system is given and force is applied then to find the acceleration we consider each body individually and apply the second law of motion. (i) Two masses 8Kg and 12Kg are connected at the ends of a light inextensible string that goes on a frictionless pulley. Find the acceleration of masses , and tension in the string when the masses are released. (ii) The force required to just move a body up an inclined plane is double the force required to prevent the body from sliding down. Find the co-efficient of friction. ($\theta=30^\circ$) (iii) A cricket player lower his hand while holding catch. Explain your answer.	2 1 1
	SECTION-E	
31(I)	(a) A projectile fired making an angle θ with horizontal having velocity u. Find expression for (i) time of flight (ii) horizontal range (iii) maximum height. (b) Show that there are two angles of projections for same horizontal range. OR	5
31(II)	(a) State parallelogram law of vectors addition. If two vectors A and B are acting	5

	on a body at an angle θ with each other, derive an expression for resultant R both in magnitude and direction. (b) If $A + B = C$ and $A = B = C$, find the angle between vector A and B.	
32(I)	(a) A car taking a turn with its maximum velocity 'v' on a curved road of angle of banking 'θ', radius of curvature 'R' and co-efficient of friction 'μ'. Derive an expression for its maximum velocity 'v'. (b) Calculate the angle through which a cyclist bends with the vertical when it moves in a circular path of circumference 34.3m in 22 seconds. ($g = 9.8\text{m/s}^2$) ($\pi = 22/7$) OR	5
32(II)	(a) State and prove principle of conservation of linear momentum for two colliding bodies using Newton's second and third laws of motion. (b) A ball of mass 250gm moving with a speed of 12m/s strike a hard wall at an angle of 30° with the wall. It is reflected at the same angle. If the ball is in contact with the wall for 0.25s, calculate the average force acting on the wall.	5
33(I)	(a) Show that the relative speed of approach equals to relative velocity of separation in case of one dimensional elastic collision. (b) A and B are two bodies having the same mass and A is moving along X-axis with a speed of 10m/s and B is at rest at the origin. After undergoing a perfectly elastic collision, with B, particle A gets scattered making an angle 30° with X-axis. What is the direction of motion of B, and the speeds of A and B, after collision? OR	5
33(II)	(a) Prove that in case of oblique elastic collision of two particles of same mass if one is at rest, after collision both particles moves at right angle to each other. (b) A car of mass 1000Kg moving with a speed of 18Km/hr on a smooth road and colliding with a horizontally mounted spring of spring constant $6.25 \times 10^3 \text{N/m}$. Find the maximum compression in the spring. (c) "Moon revolving around the earth does not do any work". Explain why?	5

KV NO.1 SAMBALPUR

AUTUMN BREAK HOLIDAY HOMEWORK

Class: XI

Subject: Chemistry

Academic Session: 2026–27

WRITTEN WORK

Chemical Bonding and Molecular Structure

Answer the following questions.

- 1.State the octet rule and mention its limitations.
- 2.Draw Lewis structures of NH_3 , H_2O , CO_2 , NO_2 and O_3 .
- 3.Define formal charge and calculate the formal charges in a suitable Lewis structure.
- 4.Explain ionic bond formation using NaCl as an example.
- 5.What is resonance? Explain with the help of the carbonate ion.
- 6.Explain the difference between sigma and pi bonds.
- 7.Predict the shapes of BeCl_2 , BF_3 , CH_4 , NH_3 and H_2O using VSEPR theory.
- 8.Explain hybridisation and identify the hybridisation of carbon in CH_4 , C_2H_4 and C_2H_2 .
- 9.Explain hydrogen bonding and distinguish between intermolecular and intramolecular hydrogen bonding.
- 10.Using molecular orbital theory, explain the bond order and magnetic nature of O_2 .

-Use NCERT textbooks as the primary reference.

Submit the completed work on the first working day after the Autumn Break, as instructed by the school.

Be prepared for a short oral assessment or worksheet after the break.

PM SHRI KENDRIYA VIDYALAYA NO.01 SAMBALPUR

AUTMN BREAK (2026-27) HOMEWORK

CLASS: XI

SUBJECT : MATHEMATICS

INSTRUCTIONS: Do all these questions in a separate file (A-4 sheets)

SETS

1. Write down all possible subsets of sets $\{1,2\}$
2. Write down all possible subsets of sets $\{a,b,\{c\}\}$
3. Write number proper subset of a set having six elements.

Write the following sets in set builder form (Question 5 to Question 8)

4. $A = \{5, 10, 15, 20, 25\}$
5. $B = \{5, 25, 125, 625, 3125\}$
6. $C = \{2, 5, 10, 17, 26\}$
7. $D = \{1/2, 2/3, 3/4, 4/5, 5/6\}$
8. $E = \{1/2, 2/5, 3/10, 4/17, 5/26\}$

Write the following sets in roaster form (Question 10 to Question 12)

9. $A = \{x: x \in \mathbb{Z}, x^2 < 25\}$
10. $B = \{x: x \text{ is a letter of the word "principal"}\}$
11. $C = \{x: x \text{ is a two digit natural number such that sum of its digit is 8}\}$
12. $D = \{x: x \text{ is a natural number and divisor of 36}\}$
13. For $A = \{1, 2, 3, 4, 5, 6\}$; $B = \{3, 4, 5, 6\}$, $C = \{4, 5, 7, 8\}$ and $U = \{1, 2, \dots, 8\}$

Find (a) $(A - B)'$, (b) A'

14. For $A = \{1, 2, 3, 4, 5, 6\}$; $B = \{3, 4, 5, 6\}$, $C = \{4, 5, 7, 8\}$ and $U = \{1, 2, \dots, 8\}$

Verify that (1) $(A \cup B)' = A' \cap B'$;

$$(2) (A \cap B)' = A' \cup B'$$

15. For $A = \{1, 2, 3, 4, 5, 6\}$; $B = \{3, 4, 5, 6\}$, $C = \{4, 5, 7, 8\}$ and $U = \{1, 2, \dots, 8\}$

Verify that (1) $A - (B \cup C) = (A - B) \cap (A - C)$

(2) $A \cap (B - C) = (A \cap B) - (A \cap C)$

16. A and B are two sets such that $n(A) = 3$ and $n(B) = 6$

Find (1) minimum value of $n(A \cup B)$ (2) maximum value of $n(A \cap B)$.

17. Let A, B and C be 3 sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$ show $B = C$.

18. If $A \subset B$ show that $(C - B) \subset C - A$

19. If $A \subset B$ and $B \subset C$, is it true that $A \subset C$, Explain giving example.

20. Find $A \cup B$ and $A \cap B$ if $A = \{x : x \in \mathbb{Z} \text{ and } x^2 \leq 36\}$, $B = \{x : x \text{ is a prime natural number whose square is } < 50\}$

RELATIONS AND FUNCTIONS

1. If $A = \{2, 3\}$, $B = \{1, 2, 3, 4\}$ and $C = \{3, 4, 5, 6\}$ verify that

(i) $A \times (B \cap C) = (A \times B) \cap (A \times C)$ (ii) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

2. If $A = \{1, 2, 3\}$, $B = \{4, 5, 6\}$ and $C = \{1, 2\}$ find $(A - B) \times (A \cap C)$

3. If $A = \{3, 5\}$, $B = \{5, 6\}$ and $C = \{3, 6\}$, find $(A \times C) - (A \times B)$

4. $A = \{1, 0, -1\}$, $B = \{2, 3\}$, $C = \{1, -1\}$, find $A \times B \times C$ and $B \times A \times C$

5. If $(a, 1)$, $(b, -1)$ and (c, c) are three elements of $A \times B$ and $n(B \times A) = 9$, Find the sets A,

B and $B \times C$. Ans $\{a, b, c\}$, $\{1, -1, c\}$, $\{(a, 1), (a, -1), (a, c), (b, 1), (b, -1), (b, c), (c, 1), (c, -1), (c, c)\}$

6. 7. If $A = \{x : x \in \mathbb{N}, x < 4\}$, $B = \{x : x^2 + 5x - 6 = 0, x < 0\}$ then find $A \times B$

7. Let $A = \{1, 2, 3, 4, 5, 6\}$ Define a relation R on set A , $R = \{(x, y) : y = x + 1\}$. Write R ,

represent R using arrow diagram and also write domain and range of R .

8. $f : R \rightarrow R$ is defined by, $f(x) = \begin{cases} 1 & , x \in Q \\ -1 & , x \notin Q \end{cases}$. Find $f\left(\frac{1}{4}\right)$, $f(\pi)$, $f(\sqrt{2})$

9. Find the domain and range of function given by $f(x) = \frac{x-1}{x-5}$

10. Find domain and range of following functions:

$$\text{a) } f(x) = \sqrt{x-4} \quad \text{b) } f(x) = \frac{1}{\sqrt{1-x}} \quad \text{c) } f(x) = \sqrt{25-x^2} \quad \text{d) } f(x) = \frac{x^2-4}{x-2}$$

$$\text{e) } f(x) = \frac{9-x}{x-9} \quad \text{f) } f(x) = \frac{3x-2}{2x-5}$$

TRIGONOMETRY CLASS XI

1) Evaluate

$$\text{(i) } \cos(-480^\circ) \quad \text{(ii) } \sin(-1125^\circ) \quad \text{(iii) } \cot(690^\circ) \quad \text{(iv) } \sin(-765^\circ)$$

$$\text{(v) } \cos 120^\circ$$

2) (i) Show that $\cos 510^\circ \cdot \cos 330^\circ + \sin 390^\circ \cdot \cos 120^\circ = -1$

$$\text{(ii) Show that } \sin(-420^\circ) \cos 390^\circ + \cos(-660^\circ) \sin 330^\circ = -1$$

3) Evaluate $\cot(90^\circ + x) + \tan(180^\circ + x) + \sec(360^\circ - x) + \operatorname{cosec}(270^\circ - x)$

$$4) \text{ If } A - B = \pi/4, \text{ Show that } (1 + \tan A)(1 + \tan B) = 2 \tan A$$

$$5) \text{ If } \tan(A + B) = x \text{ and } \tan(A - B) = y, \text{ then Find } \tan 2A$$

$$6) \text{ Show that } \tan 8\theta - \tan 6\theta - \tan 2\theta = \tan 8\theta \cdot \tan 6\theta \cdot \tan 2\theta$$

$$7) \text{ Show that } \cot 3x \cdot \cot 4x - \cot 7x \cdot \cot 3x - \cot 7x \cdot \cot 4x = 1$$

$$8) \text{ Show that } \cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ = 1/16$$

$$9) \text{ Show that } \sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ = 3/16$$

$$10) \text{ If } A + B = \pi/4, \text{ Show that } (1 + \tan A)(1 + \tan B) = 2$$

COMPLEX NUMBERS

- 1) $i^{49} + i^{68} + i^{89} + i^{110}$
- 2) $i^{37} + i^{-67}$
- 3) $1 + i^{10} + i^{20} + i^{30}$
- 4) $2i^2 + 6i^3 + 3i^{16} - 6i^{19} + 4i^{25} + 4$
- 5) Show that $i^n + i^{n+1} + i^{n+2} + i^{n+3} = 0$
- 6) Show that $(-i)^{4n+3} = i$

Express in standard form

$$7) \frac{2-5i}{3+6i}$$

$$8) \frac{(2+3i)(3-2i)}{(2+5i)(5+2i)}$$

$$9) \frac{2+3i}{1+2i} + \frac{1+i}{2+i}$$

$$10) \frac{(1+i)(1+2i)}{1+3i}$$

11) Find x and y in the following case

$$3x + (2x - 3y)i = 6 + 3i$$

12) Find x and y in the following case

$$13) (x+i)(x+iy) = 2 - 5i$$

14) Find x and y in the following case

$$(x+iy)(2-3i) = 4-3i$$

15) Find the conjugate and the modulus of the followings

$$a) (3-2i)(3+2i)(1+i) \quad b) (2+3i)^2$$

16) If conjugate of $(x+iy)(2-3i)$ is $7+4i$, find x & y

17) If conjugate of $(x-iy)(3+5i)$ is $-6-24i$, find x & y

18) If $\left(\frac{1+i}{1-i}\right)^{100} = a + bi$, find a and b

19) Find the least value of n if $\left(\frac{1+i}{1-i}\right)^n = 1$

20) If $z_1 = 2 + 3i$ and $z_2 = -1 + 3i$, then find $\text{Im} \left(\frac{z_1 z_2}{\bar{z}_1} \right)$

LINEAR INEQUALITIES

Solve for x from Q No 1 to 9

1. $\frac{3(x-2)}{5} \leq \frac{5(2-x)}{3}$

2. $2(2x+3) - 10 < 6(x-2)$

3. $3(2-x) \geq 2(1-x)$

4. $37 - (3x+5) \geq 9x - 8(x-3)$

5. $\frac{5-2x}{3} \leq \frac{x}{6} - 5$

6. $-3 \leq -3x + 2 < 4$,

7. $\frac{(2x-1)}{3} \geq \frac{(3x-2)}{4} - \frac{(2-x)}{5}$

8. $\frac{x}{4} < \frac{(5x-2)}{3} - \frac{(7x-3)}{5}$

9. Solve the system of inequalities

$3x - 7 < 5 + x$ and $11 - 5x \leq 1$ and represent the solutions on the number line

10. A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18%?

PERMUTATIONS AND COMBINATIONS

Case study based

Q.1 A state cricket authority has to choose a team of 11 members, to do it so the authority ask 2 coaches of a government academy to select the team

Members that have experience as well as best performer in the last 15 matches. They can make up a team of 11 cricketers amongst 15 possible candidates in which 5 players can bowl.



- (i) In how many ways can the final eleven be selected from 15 cricket players ?
- (ii) In how many ways can the final eleven be selected if exactly 4 bowlers must be included.
- (iii) In how many ways can the final eleven be selected if all bowlers must be included.

Sol. (i) ${}^{15}C_{11} = 1365$

(ii) 4 bowlers can be select by $= {}^5C_4$

Remaining 7 players can be select out of 10 (15-5) is $= {}^{10}C_7$

Total no. of ways is $= {}^5C_4 \cdot {}^{10}C_7 = 600$

(iii) all 5 bowlers can be select by $= {}^5C_5$

Remaining 6 players can be select out of 10 (15-5) is $= {}^{10}C_6$

Total no. of ways is $= {}^5C_5 \cdot {}^{10}C_6 = 210$

Short answer type question

Q.1 How many number of rectangle forming by 5 different horizontal parallel lines and 7 other different vertical parallel line.

Sol. A rectangle forming by two horizontal and two vertical parallel lines

No. of rectangle $= {}^5C_2 \cdot {}^7C_2 = 10 \cdot 21 = 210$

Q.2 How many arrangement of the letters of the word APPLICATION.

Sol. Total letters 11, A = 2, P=2, I=2

No. of arrangements $= \frac{11!}{2! \cdot 2! \cdot 2!} = 4989600$

Q.3 There are 12 point on a circle. How many chord can be draw? Find number of intersection of all chord in the circle?

Sol. No. of chord $= {}^{12}C_2$

No. of intersection of chord = no. of quadrilateral can be made $= {}^{12}C_4$

Long answer type questions

Q.1 Find rank of the word MONDAY in the dictionary wise all arrangements of word MONDAY, also find the word which will on the rank 400.

Sol. Arrange alphabetically A,D,M,N,O,Y

Starting from A _ _ _ _ _ can be arrange by $= 5! = 120$

Starting from D _ _ _ _ _ can be arrange by $= 5! = 120$

Starting from M A _ _ _ _ can be arrange by = $4! = 24$
 Starting from M D _ _ _ _ can be arrange by = $4! = 24$
 Starting from M N _ _ _ _ can be arrange by = $4! = 24$
 Starting from M O A _ _ _ can be arrange by = $3! = 6$
 Starting from M O D _ _ _ can be arrange by = $3! = 6$
 Starting from M O N A _ _ can be arrange by = $2! = 2$
 Starting from M O N D A Y can be arrange by = $1! = 1$
 Rank = $120 + 120 + 24 + 24 + 24 + 6 + 6 + 2 + 1 = 327$

	rank
Starting from A _ _ _ _ _ can be arrange by = $5! = 120$	120
Starting from D _ _ _ _ _ can be arrange by = $5! = 120$	240
Starting from M _ _ _ _ _ can be arrange by = $5! = 120$	360
Starting from N A _ _ _ _ can be arrange by = $4! = 24$	384
Starting from N D A _ _ _ can be arrange by = $3! = 6$	390
Starting from N D M _ _ _ can be arrange by = $3! = 6$	396
Starting from N D O A _ _ can be arrange by = $2! = 2$	398
Starting from N D O M _ _ can be arrange by = $2! = 2$	400 answer

Q.2 Find the arrangements of the letters of the word VOLUMES. Find the arrangements if:-

- (a) all vowels come together.
- (b) all vowels don't come together.
- (c) vowel don't come together.

Sol. Total alphabets = 7, vowels = 3

Total arrangements = $7! = 5040$

(a) All vowels OUE is a one unit and remaining V, L, M, S can be arrange = $5! \cdot 3! = 720$

(b) Total arrangements – all vowels come together = $7! - 5! \cdot 3! = 5040 - 720 = 4320$

(c) _ V _ L _ M _ S _ three vowels can be on these 5 gaps = ${}^5C_3$

And 3 vowels can be arrange by = $3!$

And 4 consonants can be arrange by = $4!$

Then total arrangement = ${}^5C_3 \cdot 3! \cdot 4! = 10 \cdot 6 \cdot 24 = 1440$

III .Questions for Practice

MCQs

Q.1 Number of words from the letters of the word **BHARAT** in which B and H will never come together is:

- (a) 210 (b) 240 (c) 422 (d) 400

Q.2 There are 10 true-false questions in a examination. If all questions are compulsory then these questions can be answered in:

- (a) 210 (b) 512 (c) 422 (d) 1024

Q.3 If ${}^{15}\text{Cr} : {}^{15}\text{Cr}_L = 11:5$ then r equals

- (a) 15 (b) 11 (c) 5 (d) 4

Q.4 A polygon has 35 diagonals. Find the number of its sides.

- (a) 7 (b) 16 (c) 10 (d) 70

Q.5 ASSERTION-REASON

In the following question, a statement of assertion (A) is followed by a statement of Reason(R).

Assertion (A): ${}^{13}\text{C}_9 = {}^{13}\text{C}_6$

Reason(R): Selection of the r distinct things out of n is equal to the rejection of the (n-r) distinct

things out of n.

Choose the correct answer out of the following choices.

- (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.

Case study based

Q.1 In a company, CEO wants to establish a new branch. New branch required a committee of 5 members is to be formed out of 6 gents and 4 ladies.



In how many ways this can be done, when

- i. At least two ladies are included?
- ii. At most two ladies are included?

Q.2 Read the following passage and answer the questions given below.

Every person has Independence thought.



Find the number of arrangements of the letters of the word INDEPENDENCE. In how many of these arrangements,

- (i) Do the words start with P
- (ii) Do all the vowels always occur together
- (iii) Do the vowels never occur together

OR

Do the words begin with I and end in P?

Q.3 Read the following passage and answer the question given below.

The longest river of North America is *Mississippi River*

In how many ways can the letters of the word MISSISSIPPI be arranged Such that

- (i) All letters are used
 - (ii) All I's are together
 - (iii) All I's are not together
- OR
- All S's are not together



Short answer type question

Q.1 If ${}^{10}P_r = 5040$, find the value of r

Q.2 If ${}^5P_r = 6 \cdot {}^5C_{r-1}$, find value of r .

Q.3 How many 6-digit number can be formed from the digits 0,1,3,5,7,9 which are divisible by 10

and no digit is repeated ?

Q.4 How many words can be formed by using the letters of the word ORIENTAL, so that the vowels always occupy the odd places ?

Q.5 How many squares in a chess board?

Q.6 How many palindrome of 5 letters can be made by using letters of the word MATHS?

Q.7 It is required to seat 5 men and 4 women in a row so that the women occupy the even places. How many such arrangements are possible ?

Q.8 Given 12 flags of different colours, how many different signals can be generated if each signal

requires the use of 2 flags, one below the other?

Q.9 There are four bus routes between A and B; and three bus routes between B and C. A man can

travel round-trip in number of ways by bus from A to C via B. If he does not want to use a bus route more than once, in how many ways can he make round trip?

Q.10 In an examination there are three multiple choice questions and each question has 4 choices. Find the number of ways of answering all the questions?

Biology Autumn Break Homework

- Complete your practical records.
- Revise and practice questions for your upcoming half yearly exam.
- Solve following questions in your biology homework notebook.

1 The taxonomic categories are distinct biological entities and not merely morphological aggregates. Each category is referred to as a unit of classification, and is termed as taxon:

(a) Name the (i) highest and ii) lowest categories in the taxonomic hierarchy.

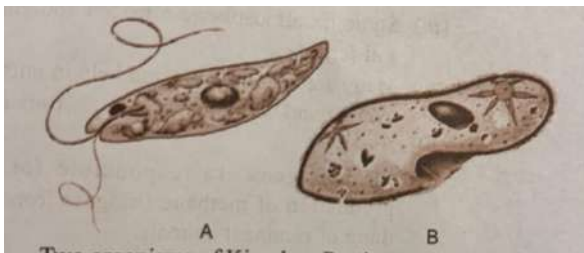
(b) Name the category of the taxa (i) Felidae and (ii) Insecta belong to.

(c) What is the basic requirement for placing the organisms in different categories? How does it help in doing this?

(d) What is a genus? Name the genus that includes

(i) lions and ii) cats, respectively.

2. Observe the diagrams and answer the questions that follow:



Two organisms of Kingdom Protista are shown above.

(a) Identify the organisms (A) and (B) and assign them to their respective phyla.

(b) Write any two differences between them.

(c) How does B obtain its food?

3. What is meant by 'Contagium vivum fluidum'? Who gave this idea?

4. Read the following passage and answer the questions that follow:

Algae are simple thalloid, chlorophyll-bearing, aquatic (both marine and freshwater) organisms. The form and size of algae is highly variable. They are categorised into three classes.

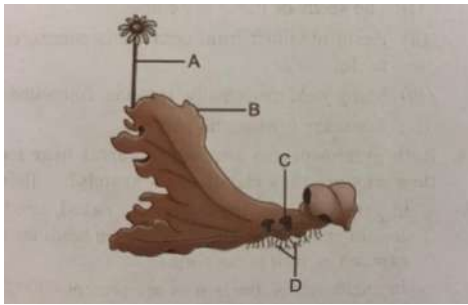
(a) Mention the two major characteristics that form the basis for this classification.

(b) Name two unicellular algae.

(c) When is reproduction described as oogamous in algae? Name two algae that are oogamous.

(d) Write any two ecological significance of algae.

5. Observe the diagram and answer the questions that follow:



(a) Identify the plant given above and name the division, it belongs to.

(b) Label the parts A, B, C and D marked on it.

(c) Give a brief description of part C.

6. Evolutionarily, the pteridophytes are the first terrestrial plants to possess vascular tissues. The pteridophytes are found in cool, damp and shady places, though some may flourish in sandy-soil conditions. Many pteridophytes are used for medicinal purposes and some are grown as ornamental plants.

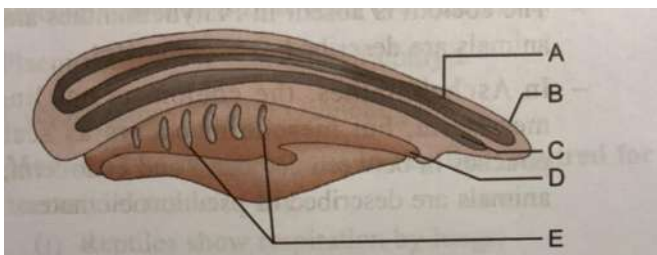
(a) Name the dominant phase in the life cycle of pteridophytes.

(b) What are the spore-bearing leaves of pteridophytes called? How are they organised in these plants?

(c) (i) Why are most ferns confined to wet areas?

(ii) Name a heterosporous lycopsid and the class the horsetails belong to.

7. A diagrammatic sketch showing the chordate characteristics is shown below. Observe the diagram and answer the questions that follow:



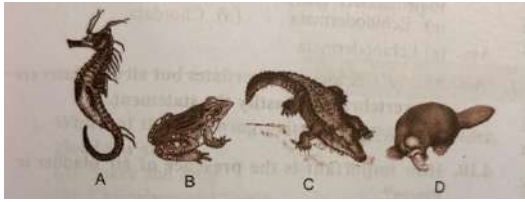
(a) Identify and name the part that makes the animal a chordate.

(b) Name two classes of animals where E is functional in the adult life also.

(c) Enumerate any four characteristics that are typical of chordates.

(d) How does A in chordates differ from those in non-chordates?

8. Observe the picture showing some vertebrates and answer the questions that follow.



(a) Which among them show(s) external fertilisation?

(b) Select one animal each that shows

(i) direct development and (ii) indirect development

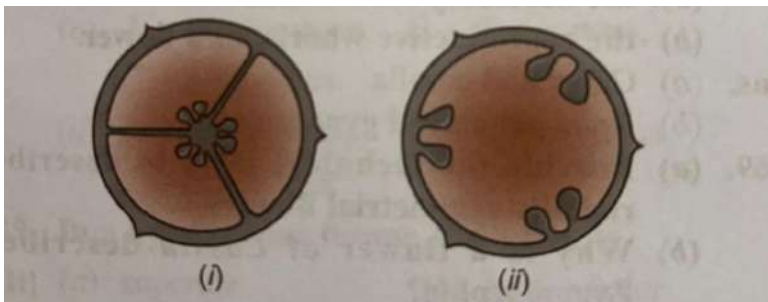
(c) Identify and write the scientific name of the animals) with

(i) two-chambered heart (ii) three-chambered heart (iii) four-chambered heart

(d) How does B differ from C in its external morphology?

9. Name the phylum which was earlier considered as a sub-phylum of the phylum Chordata, but now in a separate phylum under non-chordates. Write any six characteristic features of the animals of this phylum. Give two examples.

10. Name the type of placentation shown in the given figures (i) and (ii). Give one example of each type.



11. Differentiate between

(a) Racemose and cymose inflorescence

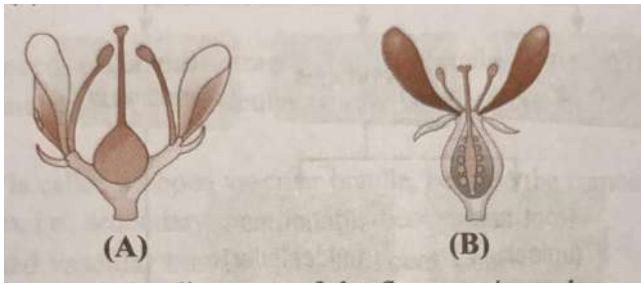
(b) Apocarpous and syncarpous ovary

12. Observe the diagrams of the flowers given above and answer the following questions:

(a) Which of the two-A or B or both is/are complete flower(s)? Justify your answer.

(b) How are they different from each other?

(c) Give two examples each, for flower types A and B, respectively.



13. Answer the following questions with reference to the anatomy of dicot stem:

- (a) Type of cells present in the hypodermis.
- (b) Why is the endodermis layer referred to as starch sheath?
- (c) Why are the vascular bundles present here referred to as 'open' and 'conjoint'?

14. Answer the questions with reference to the digestive system of frog:

- (a) Why is the alimentary canal of a frog short?
- (b) Name the two accessory digestive glands.
- (c) How is the absorption of digested food aided in the intestine?

15. (a) What is tonoplast?

(b) The concentration of certain ions and some materials is higher inside the vacuole than in the cytoplasm. Give a reason.

(c) Why are enzymes of lysosomes called acid hydrolases?

16. Explain

- (a) haploid insects and lower plants where cell-division occurs, and
- (b) some haploid cells in higher plants where cell-division does not occur.

17. Make diagrammatic representations of different stages of mitosis and meiosis.

PM SHRI KENDRIYA VIDYALAYA NO.1 SAMBALPUR
HOLIDAY HOMEWORK (AUTUMN BREAK)
CLASS 11 BIOTECHNOLOGY (045)

1. EXERCISE QUESTIONS OF CHAPTER – CONCEPTS OF GENETICS
2. COMPLETION OF ALL THE DIAGRAMS OF CONCEPTS OF GENETICS
3. Explain in detail Griffith's experiment w.r.t DNA as the Genetic material of the cell.
4. Enumerate the findings of O. Avery et al to prove DNA as the Genetic material
5. Illustrate Harshey-Chase Experiment with diagrams
6. What is the mode of DNA Replication ? Why is it so called ?
7. Explain in detail Messelson & Stahl's Experiment with diagrams .
8. Indicate the function of following enzymes :-
a)DNA POLYMERASE b)TOPOISOMERASE c)HELICASE d)DNA LIGASE e)PRIMASE
9. Why does DNA Replication occur in 5'—3' direction ?
10. Why does primer require for DNA Replication ?
11. What is proof-reading activity of DNA Polymerase ? How is it done ?
12. Which enzyme is responsible for performing following functions :-
 - a)Release of super coiled st. of DNA
 - b)Formation of nick
 - c)Separation of two strands of DNA
 - d)Synthesis of primer
 - e) Polymerization of polynucleotide strand
 - f)Removal of primer
 - g)Proof-reading activity
 - h)Sealing of gap in newly synthesised DNA strands

CLASS XI – COMPUTER SCIENCE

AUTUMN BREAK HOLIDAY HOMEWORK

Section A – Problem-Solving and Python Fundamentals

1. List the main steps involved in problem-solving. Explain any three steps briefly.
2. Differentiate between an algorithm, a flowchart and pseudocode. Write an algorithm to find the larger of two numbers.
3. What are Python keywords, identifiers, literals and operators? Give one example of each.
4. Differentiate between mutable and immutable data types in Python. Classify list, tuple, string and dictionary accordingly.
5. Predict the output of the following code and identify the data type of each variable:

```
a = 10
b = 2.5
c = a + b
print(c)
print(type(c))
```

Section B – Flow of Control and Strings

6. Write a Python program to input a number and check whether it is divisible by both 3 and 5.
7. Write a Python program to input three numbers and display them in ascending order.
8. Write a Python program using a for loop to calculate the factorial of a positive integer.
9. Given the string text = "Computer Science", write Python statements to:
 - Display its length.
 - Display the string in uppercase and lowercase.
 - Check whether it starts with "Computer".
 - Count the number of occurrences of the letter "e".
 - Display the substring "Science" using slicing.

Section C – Lists and Programming Applications

10. Consider the list numbers = [12, 5, 8, 12, 3, 9]. Write Python statements to append 15, insert 7 at index 2, remove the first occurrence of 12, sort the list, and display the maximum, minimum and sum of its elements.
11. Write a Python program to input five numbers into a list and calculate their mean.
12. Write a Python program to search for a number in a list using linear search. Display an appropriate message depending on whether the number is found.
13. Write a Python program to count the frequency of each element in a list.
14. Write a Python program using nested loops to display the following pattern:

```
1
1 2
1 2 3
1 2 3 4
```
15. Identify whether each situation is most likely to produce a syntax error, a runtime error or a logical error: (a) missing colon after an if statement, (b) dividing a number by zero, (c) a program calculates the average incorrectly.

CLASS XI – INFORMATICS PRACTICES

AUTUMN BREAK HOLIDAY HOMEWORK

Section A – Python Basics and Control Statements

1. Differentiate between interactive mode and script mode in Python.
2. Identify the keywords, identifiers and constants in the following statement: `total = marks + 10`.
3. Predict the output of the following code and state the data type of each variable:
 - `a = 10`
 - `b = 2.5`
 - `c = a + b`
 - `print(c)`
 - `print(type(c))`
4. Explain the difference between mutable and immutable data types. Give one example of each.
5. What is operator precedence? Evaluate the expression `5 + 2 * 3 ** 2`.
6. Write a Python program to input a number and display whether it is positive, negative or zero.
7. Write a Python program using a for loop to display the first 10 natural numbers and their sum.
8. Write a Python program to input a number and check whether it is divisible by both 3 and 5.

Section B – Lists, Dictionaries and NumPy

9. Consider the list `Marks = [78, 65, 92, 65, 84]`. Write Python statements to display its length, count the occurrences of 65, sort the list, and display the maximum and minimum marks.
10. Write a Python program to input five numbers into a list and calculate their sum and average.
11. Write Python statements to insert 70 at index 2, append 95, remove the first occurrence of 65, and display the updated list: `Marks = [78, 65, 92, 65, 84]`.
12. Consider the dictionary `Student = {"Aman": 85, "Riya": 92, "Mohit": 76}`. Write Python statements to update Mohit's marks to 80, add Neha with 88 marks, and display all student names and marks.
13. Explain any four dictionary methods or functions from the following: `dict()`, `len()`, `keys()`, `values()`, `items()`, `update()` and `clear()`.
14. Write a Python program to create a dictionary containing the names of three books and their available copies. Display the book names and update the copies of one book.
15. What is NumPy? Write Python code to create and display a NumPy array from the list `[10, 20, 30, 40, 50]`.

HOLIDAY HOMEWORK OF PAT (CLASS 11TH)

1. Explain Sai Khelo India Fitness Test and its test batteries.
2. Explain type of sports injuries and its prevention.
3. Explain First Aid, CPR and its type.
4. Write down the safety rules during physical activity.
5. Prepare a lesson plan on volleyball and basketball.

Write down these topics in practical file.