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PA-IV Assignment: 2025 26

Class-XII Science

DATE OF SUBMISSION: 28-11-25

1.	ENGLISH <u>Poets and Pancakes</u> ❖ <u>Easy Level Questions</u> 1. Who is the author of Poets and Pancakes? 2. What was the name of the studio discussed in the chapter? 3. What was “Pancake” in Gemini Studios? 4. Who was the boss of Gemini Studios? 5. Where was Gemini Studios located? 6. What is the setting of Poets and Pancakes? 7. Why was the make-up department called the “Pancake department”? 8. Who was the boss of Gemini Studios and what kind of person was he? 9. What was Asokamitran’s role in Gemini Studios? 10. How does Asokamitran describe the atmosphere in Gemini Studios? ❖ <u>Medium Level Questions</u> 1. What work was done in the make-up department of Gemini Studios? 2. Why does the author mention that the make-up department looked like a hair-cutting salon? 3. What was the political inclination of most people in Gemini Studios? 4. Who was the legal adviser and what was peculiar about him? 5. What did the author, Asokamitran, do at Gemini Studios? 6. How does the author use humor to describe the make-up department? 7. What do we learn about the people working in Gemini Studios? 8. What was the incident involving the legal adviser and the actress? 9. Why were the people at Gemini Studios excited about the visit of an English poet? 10. What does Poets and Pancakes tell us about the author’s personality? ❖ <u>Hard Level Questions</u> 1. Describe the irony in the visit of the English poet to Gemini Studios. 2. What was the author’s reaction after finding Stephen Spender’s name later in The Encounter magazine? 3. What does the chapter reveal about the contrast between film world glamour and reality? 4. How does Asokamitran use humor and satire in the essay? 5. What is the main theme or message of Poets and Pancakes? 6. Explain the irony of Stephen Spender’s visit to Gemini Studios. 7. Discuss the theme of illusion versus reality in Poets and Pancakes. 8. How does Poets and Pancakes reflect the clash between literature and cinema? 9. Analyze Asokamitran’s narrative style in Poets and Pancakes. 10. What is the main message of Poets and Pancakes? <u>Memories of childhood</u> ❖ <u>Easy Questions</u> 1. What is the main theme of “Memories of Childhood”? 2. Who are the two authors of the chapter “Memories of Childhood”? 3. What made Zitkala-Sa feel uncomfortable at the school? 4. What community did Bama belong to? 5. What lesson did Bama’s brother Annan teach her? 6. Describe Zitkala-Sa’s experience at the school when she was forced to have her hair cut. 7. How does Bama’s story “We Too Are Human Beings” reflect the caste discrimination in Indian society? 8. What similarities do Zitkala-Sa and Bama share in their childhood experiences? 9. What lesson did Bama learn from her brother, and how did it change her life? 10. What does the title “Memories of Childhood” signify? ❖ <u>Medium Questions</u> 1. How did Zitkala-Sa react when her hair was about to be cut? 2. Why did the people in Bama’s village carry packets of food without touching them? 3. What emotions did Bama feel when she realized the reason for the man’s behavior with the food packet?
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4. How are the childhood experiences of Zitkala-Sa and Bama similar?
5. What message does “Memories of Childhood” convey to readers?
6. How does Zitkala-Sa’s story criticize the forced assimilation of Native Americans?
7. Discuss the emotional transformation that Bama undergoes in her story.
8. How are gender and social discrimination portrayed in “Memories of Childhood”?
9. How does education serve as a tool of empowerment in both stories?
10. What impact do the childhood experiences have on the adult lives of Zitkala-Sa and Bama?

❖ Difficult Questions

1. Analyze how “Memories of Childhood” portrays the theme of cultural identity and resistance.
2. Compare the settings of Zitkala-Sa’s and Bama’s experiences. How do they influence the narratives?
3. How does language play a role in oppression and liberation in “Memories of Childhood”?
4. What is the significance of hair-cutting in Zitkala-Sa’s story?
5. Discuss how the personal experiences of the authors become a form of social protest.
6. Examine the theme of resistance and identity in “Memories of Childhood.”
7. Compare how colonization and caste oppression are represented through personal experiences.
8. How does “Memories of Childhood” use personal narrative to make a political statement?
9. Discuss how the act of storytelling helps preserve cultural memory and inspire social change.
10. Analyze how the two parts of “Memories of Childhood” complement each other in message and tone.

2. PHYSICS

Level 1 Questions

1. State Bohr’s quantization condition of angular momentum.
2. Derive the expression for velocity of an electron in the nth orbit.
3. Why does hydrogen atom have many spectral lines even though it has only one electron?
4. Which EM wave has the longest wavelength?
5. What is the frequency range of visible light?
6. State any two properties of EM waves.
7. Write the uses of X-rays.
8. Draw the electromagnetic spectrum.
9. Give two examples of intrinsic semiconductors.
10. What are majority and minority carriers in an n-type semiconductor?

Level 2 Questions

1. Derive the expression for total energy of an electron in the nth Bohr orbit of hydrogen.
2. Explain how the radius of the nth Bohr orbit varies with n. Calculate the radius of the 3rd orbit.
3. Derive the formula for wavelength of emitted radiation during a transition from n_2 to n_1 .
4. Explain how displacement current completes the continuity of current in a capacitor.
5. Derive the relationship between speed of EM waves, permittivity, and permeability of free space.
6. Write Maxwell’s equations and explain how they predict the existence of EM waves.
7. Explain the formation of p-type and n-type semiconductors with energy band diagrams.
8. Draw the energy band diagram of a p-n junction in forward and reverse bias. Explain both.
9. Draw the electromagnetic spectrum showing approximate wavelength ranges for all regions.
10. Explain the observations from alpha particle scattering experiment by Rutherford. How did it lead to the nuclear model of an atom?

Level 3 Questions

1. A hydrogen atom is in the 5th orbit. It makes a transition to the ground state through all possible paths.
 - (i) How many spectral lines will be observed?
 - (ii) Calculate the shortest and longest wavelength emitted.
2. Show that the frequency of revolution of an electron in Bohr orbit varies inversely with n^3 . Explain the physical meaning of this result.
3. In Bohr’s model, the ratio of kinetic energy to total energy of an electron in any orbit is constant. Prove this and explain its significance.
4. A photon of wavelength 102.6 nm is emitted during the de-excitation of a hydrogen atom. Identify the initial and final states involved in the transition with justification.
5. A radar uses electromagnetic waves of frequency 10 GHz.
 - (i) Calculate wavelength.
 - (ii) Explain why microwaves are used in radar instead of visible light.
6. X-rays and ultraviolet rays can both cause ionisation. Compare their penetrating power based on energy and explain with physics reasoning.
7. A radio station broadcasts at 100 MHz.
 - (i) Calculate the length of the antenna required for efficient transmission.

(ii) Explain why antennas are not used for visible light.

8. Why do gamma rays have greater biological hazards compared to X-rays? Use photon energy relations to justify.

9. Design a full-wave bridge rectifier and explain how ripple factor is reduced using a capacitor filter. Support with waveforms.

10. Draw the energy band diagram of a reverse-biased p-n junction and explain in detail how the width of the depletion region changes with applied voltage. Derive the relation if possible.

3. CHEMISTRY

Level 1 Questions

1. What is the **functional group** characteristic of an aldehyde?
2. Give the IUPAC name for the simplest ketone.
3. Which of the following has a higher boiling point: an aldehyde or a corresponding alkane, and why?
4. Write the chemical formula for **acetic acid**.
5. What is the general formula for a primary amine?
6. Name the reaction used to prepare an aldehyde or a ketone from an alkene, typically using ozone.
7. Which type of carboxylic acid derivative is formed when a carboxylic acid reacts with an alcohol in the presence of an acid catalyst?
8. Is **aniline** a primary, secondary, or tertiary amine?
9. Which test is commonly used to distinguish between an aldehyde and a ketone, giving a silver mirror precipitate?
10. What is the approximate bond angle around the nitrogen atom in an amine?

Level 2 Questions

11. Explain why **carboxylic acids** are more acidic than **phenols**.
12. Describe the key reagent and intermediate in the **Hell-Volhard-Zelinsky (HVZ) reaction** used for alpha-halogenation of carboxylic acids.
13. Complete the following reaction:
Benzaldehyde + Conc. NaOH $\xrightarrow{\text{heat}}$?
Name the specific reaction.
14. Rank the following in order of increasing basicity:
Ammonia, Aniline, Methylamine.
1. Explain Aldol condensation reaction by taking an example.
2. Outline the mechanism (or key steps) for the **nucleophilic addition** of HCN to an aldehyde.
3. Starting from a suitable carboxylic acid, how would you prepare the corresponding acid chloride? Write the balanced reaction.
4. Which compound will undergo the **iodoform test**: **Acetone** or **Propanal**? Justify your answer.
5. How can you convert an **amide** into an **amine** containing one less carbon atom? Name the reaction.
6. Why is the **carbonyl carbon** in aldehydes and ketones susceptible to **nucleophilic attack**?

Level 3 Questions

1. Outline a synthetic route to convert **toluene** into **benzoic acid**.
2. Explain the electronic effects that make the **amino group** an *o*, *p*-director and an **activating group** in electrophilic aromatic substitution, despite nitrogen's electronegativity.
3. Why does **ethanal** readily undergo **aldol condensation**, while **benzaldehyde** does not (or requires different conditions)?
4. Propose a two-step synthesis to convert **butan-1-ol** into **butanoic acid**.
5. Compare and contrast the products formed when **propanone** reacts with **lithium aluminium hydride** versus **Grignard reagent followed by hydrolysis**.
6. An aromatic amine is treated with NaNO_2 and HCl at $0\text{--}5^\circ\text{C}$, followed by reaction with CuBr .
 - What is the name of this overall transformation?
 - What is the final product starting from **Aniline**?
7. Predict the major product and write the reaction for the nitration of **benzamide**. Is the amide group an *o*, *p*-director or a *m*-director?
8. Design a synthesis for **2-methylpropanoic acid** using **Grignard reagent** and **carbon dioxide**
9. Describe the key intermediate and driving force for the **Curtius rearrangement** used to prepare primary amines.

	<p>10. The acidity of substituted benzoic acids is affected by the substituent. Predict and explain whether p-nitrobenzoic acid or p-methoxy benzoic acid is the stronger acid.</p>
4.	<p>MATHEMATICS</p> <p>Level 1:</p> <ol style="list-style-type: none"> Find a vector of magnitude 5 units, and parallel to the resultant of the vectors $\vec{a} = 2\hat{i} + 3\hat{j} - \hat{k}$ and $\vec{b} = \hat{i} - 2\hat{j} + \hat{k}$. Find the coordinates of points on $\frac{x}{1} = \frac{y-1}{2} = \frac{z+1}{2}$ which are at a distance of $\sqrt{11}$ units from origin. The scalar product of the vector $\hat{i} + \hat{j} + \hat{k}$ with a unit vector along the sum of vectors $2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\lambda\hat{i} + 2\hat{j} + 3\hat{k}$ is equal to one. Find the value of λ. Find the equations of the diagonals of the parallelogram PQRS whose vertices are P (4, 2, -6), Q (5, -3, 1), R (12, 4, 5), S (11, 9, -2). Use these equations to find the point of intersection of diagonals Two dice are thrown. Define are the following two events A and B: $A = \{(x, y) : x + y = 9\}, B = \{(x, y) : x \neq 3\}$, where (x, y) denote a point in the sample space. Check if events A and B are independent or mutually exclusive. <p>Level 2:</p> <ol style="list-style-type: none"> The scalar product of the vector $\hat{i} + \hat{j} + \hat{k}$ with a unit vector along the sum of vectors $2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\lambda\hat{i} + 2\hat{j} + 3\hat{k}$ is equal to one. Find the value of λ. Find a unit vector perpendicular to each of the vector $\vec{a} + \vec{b}$ and $\vec{a} = -\vec{b}$ where $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$. If $\vec{a} = 2$, $\vec{b} = 3$, and $\vec{a} \cdot \vec{b} = 4$, then evaluate $\vec{a} + 2\vec{b}$. Find the cartesian equation of the line which passes through the point $(-2, 4, -5)$ and parallel to the line given by $\frac{x+3}{3} = \frac{y-4}{5} = \frac{z+8}{6}$. Solve the following linear programming problem graphically. Maximise $Z = 20x + 30y$ Subject to the constraints: $x + y \leq 80$, $2x + 3y \geq 100$, $x \geq 14$, $y \geq 14$. <p>Level 3:</p> <ol style="list-style-type: none"> Find the image of A' of the point A(2, 1, 2) in the line l: $\vec{r} = 4\hat{i} + 2\hat{j} + 2\hat{k} + \lambda(\hat{i} - \hat{j} - \hat{k})$. Also find the equation of line joining AA'. Find the foot of perpendicular from point A on the line l. In a city, a survey was conducted among residents about their preferred mode of commuting. It was found that 50% people preferred using public transport, 35% preferred using a bicycle and 20% use both public transport and a bicycle. If a person is selected at random, find the probability that: <ol style="list-style-type: none"> The person uses only public transport. The person uses a bicycle, given that they also use the public transport. The person uses neither public transport nor a bicycle. A person is Head of two independent selection committees I and II. If the probability of making a wrong selection in committee I is 0.03 and that in committee II is 0.01, then find the probability that the person makes the correct decision of selection: <ol style="list-style-type: none"> in both committees in only one committee Find the shortest distance between lines $\vec{r} = (6\hat{i} + 2\hat{j} + 2\hat{k}) + \lambda(\hat{i} - 2\hat{j} + 2\hat{k})$ and $\vec{r} = (-4\hat{i} - \hat{k}) + \mu(3\hat{i} - 2\hat{j} - 2\hat{k})$. Case-Study: A class XII students appearing for competitive examination was asked to attempt the following questions. Let \vec{a}, \vec{b} and \vec{c} be three non-zero vectors. Based on the above information, answer the following questions. <ol style="list-style-type: none"> If \vec{a} and \vec{b} are such that $\vec{a} + \vec{b} = \vec{a} - \vec{b}$ then find the relation between \vec{a} and \vec{b}. If $\vec{a} = \hat{i} - 2\hat{j}$, $\vec{b} = 2\hat{i} + \hat{j} + 3\hat{k}$, then find the value of $(2\vec{a} + \vec{b}) \cdot [(2\vec{a} + \vec{b}) \times (\vec{a} - 2\vec{b})]$
5.	<p>BIOLOGY</p> <p>Level: 1</p> <ol style="list-style-type: none"> Why is a thermostable DNA polymerase needed in amplification in genetic engineering? Name the method in which foreign DNA is directly introduced into host cell. In bacterial culture some of the colonies produce blue colour in the presence of a chromogenic substrate and some did not due to the presence or absence of an insert (rDNA) in the coding sequence of the beta-galactosidase.

a) Mention the mechanism
 b) How is it better than the technique of plating on two plates having different antibiotics?

4. Why are engineered vectors preferred by biotechnologists for transferring the desired genes into another organism?

5. Dr. Arun developed a vitamin A rich potato through his research on genetics.
 a) What do you call such potato plants?
 b) Who can approve the validity and safety of introducing potato for public use

6. Draw the diagram of pBR322 vector showing restriction sites

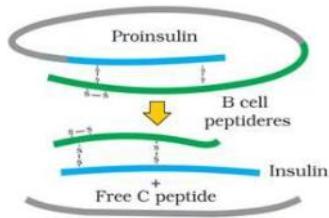
7. Give diagrammatic representation of rDNA technology

LEVEL: 2

1. How is the gene z (for B-galactosidase) used as marker?
2. State the principle underlying gel electrophoresis and mention two applications of this technique in Biotechnology.
3. Explain the work carried out by Cohen and Boyer that contributed immensely to biotechnology
4. (a) Why are restriction endonucleases so called?
 (b) What is palindromic nucleotide sequence? How do restriction endonucleases act on palindromic sites, to create sticky ends?
5. (a) Name the technique used for the separation of DNA fragments.
 (b) Write the type of matrix used in this technique.
 (c) How is the separated DNA visualized and extracted for use in rDNA technology.
6. Some cotton plants grown by farmers are known as 'Bt cotton'.
 a) What does Bt stand for
 b) What is the advantage of this cotton plant?
 c) How did scientists achieve this?
 d) 4.
 e) A method to prevent infestation of a nematode Meloidogyne incognita on roots of tobacco is silencing the specific mRNA. What is the scientific name of the technique? How is this performed by dsRNA?
7. Describe briefly the production of humulin.

LEVEL: 3

1. Identify the following image. Give its importance in rDNA technology.



2. What you mean by humulin? Give its uses.
3. Give the different roles played by transgenic animals. What is the importance of GEAC in the production of transgenic organisms?
4. Give a reason why:
 (a) Transgenic animals are used for the production of biological components of medicines over synthetic industrial production.
 (b) In the process of testing for effects of chemicals, transgenic animals are used rather than non-transgenic ones.
5. Give a reason why, although a toxin, Bt toxins are deadly for insects but not for plants producing them.
6. CRISPR is a gene editing technique for which the developers won the Nobel Prize. Indian scientists are in the process of developing resilient and high-yield varieties of rice using this technology and providing these to Indian farmers by 2024, once approved.
 (a) Which organisation would be responsible for approving such varieties?
 (b) What is the purpose of establishing the organisation identified in
 (c) Describe the steps in which Bt toxins act on insects.

6.	INFORMATICS PRACTICES
	<p>Easy level:</p> <ol style="list-style-type: none"> 1. Meera loves sharing pictures and checking in at locations on social media. She also signs up for many free online contests that ask for her name, email, and phone number. Later, she begins to receive strange advertisements and spam calls. <p>Questions:</p> <ul style="list-style-type: none"> (i) What type of data trail is Meera creating by using social media and filling online forms? (ii) Identify the two types of digital footprints. (iii) Suggest one way Meera can protect her online privacy. <ol style="list-style-type: none"> 2. Rohan was assigned a project on “E-waste Management.” He copied several paragraphs directly from a website and submitted them as his own work. His teacher found the copied text using a plagiarism checker. <p>Questions:</p> <ul style="list-style-type: none"> (i) What unethical act has Rohan committed? (ii) Why is plagiarism a punishable offence? (iii) Mention any two ways Rohan can avoid plagiarism in future. <ol style="list-style-type: none"> 3. Aarav received an email claiming to be from his bank, asking him to verify his account by entering his ATM PIN and OTP through a link. He clicked the link and entered his details. Later, unauthorized transactions were made from his account. <p>Questions:</p> <ul style="list-style-type: none"> (i) Identify the type of cybercrime Aarav was a victim of. (ii) Why should users not click on unknown links? (iii) Suggest two preventive measures to avoid such crimes. <ol style="list-style-type: none"> 4. Neha’s school replaced all old desktop computers with new laptops. The old computers were dumped behind the building. After a few months, toxic smells and dead plants appeared in that area. <p>Questions:</p> <ul style="list-style-type: none"> (i) What type of waste is generated here? (ii) Mention one harmful effect of this waste. (iii) Suggest one responsible way the school can manage this waste. <ol style="list-style-type: none"> 5. Arjun created a fake profile using his classmate’s photo and started posting embarrassing comments. The classmate came to know and reported it to school authorities. <p>Questions:</p> <ul style="list-style-type: none"> (i) Identify the type of cybercrime Arjun committed. (ii) Under which act is this punishable? (iii) Suggest two cyber etiquettes Arjun should follow in the future. <p>Medium level:</p> <ol style="list-style-type: none"> 6. Priya downloaded a software for free from an unofficial website that promised to unlock “premium” features. Later, her computer began to show virus alerts and data corruption. <p>Questions:</p> <ul style="list-style-type: none"> (i) What kind of software did Priya install? (ii) Mention one risk of using such software. (iii) Suggest one safer alternative. <ol style="list-style-type: none"> 7. Tanvi spends almost 10 hours daily on her laptop attending classes, watching shows, and chatting online. She experiences eye pain, headaches, and disturbed sleep. <p>Questions:</p> <ul style="list-style-type: none"> (i) Identify two health problems caused by prolonged screen time. (ii) Name one preventive measure for each problem. (iii) Suggest any one screen-free hobby she can adopt. <ol style="list-style-type: none"> 8. Rehan developed a mobile app for farmers to track crop prices. After launch, another developer copied his idea, changed the logo, and started selling it as their own. <ul style="list-style-type: none"> (i) Which law protects Rehan’s work? (ii) Why are Intellectual Property Rights (IPR) important? (iii) Suggest one action Rehan can take to protect his work in the future. <ol style="list-style-type: none"> 9. Sneha received repeated rude messages and negative comments from anonymous users on her social media posts. She feels emotionally stressed and scared to use social media. <ul style="list-style-type: none"> (i) What type of cybercrime is Sneha facing?

(ii) Suggest two actions she should take immediately.
 (iii) Mention one government law that protects her rights.

10. Kavita's NGO collects broken mobile phones and computer parts from households and sends them to recycling centers. She also conducts workshops on reducing gadget waste.
 (i) Which concept is Kavita promoting?
 (ii) List two advantages of proper e-waste management.

Hard Level:

11. How can prolonged use of digital devices impact mental health, and what is one way to mitigate these effects?

12. List any two health hazards related to excessive use of technology and also give two points for prevention of these health hazards.

13. Explain the following:(a) Plagiarism (b) Cyberbullying (c) FOSS

14. What are intellectual property rights (IPR), and why are they important in the digital world?

15. Mention any four net etiquettes.

16. List any one advantage and one disadvantage of using technology.

17. Explain any two ways in which technology can help students with disabilities.

7. PHYSICAL EDUCATION

LEVEL-1

1. The personality trait associated with creativity, imagination and curiosity is
 (a) Neuroticism (b) Conscientiousness (c) Openness (d) Agreeableness

2. In a knockout fixture, a bye is generally given to
 (a) Teams without coaches (b) Strongest teams
 (c) Teams to adjust uneven entries (d) Teams that lost in the previous round

3. The main purpose of planning in sports management is
 (a) To punish players (b) To set objectives and decide actions
 (c) To provide refreshments (d) To distribute prizes

4. Hostile aggression is primarily aimed at
 (a) Winning a medal (b) Achieving a calm state
 (c) Causing harm to someone (d) Improving teamwork

5. What is Instrumental Aggression?

6. Define Big Five Personality Theory.

7. State four differences between Seeding and special Seeding knock-out tournament.

8. Draw a fixture of 27 team by following Knock-out tournament.

LEVEL-2 (4 MCQs)

1. A person who is sociable but still enjoys privacy and quiet time represents
 (a) Pure extrovert (b) Pure introvert (c) Ambivert (d) Instable personality

2. If 10 teams participate in a league (single league), total number of matches will be
 (a) 25 (b) 30 (c) 45 (d) 90

3. In sports tournaments, the “seeding” process ensures
 (a) Strong teams meet early (b) Strong teams get eliminated
 (c) Strong teams remain in separate halves (d) Weak teams play finals

4. Which Big Five trait is most strongly associated with cooperation and kindness?
 (a) Agreeableness (b) Neuroticism (c) Conscientiousness (d) Openness

5. State two differences between League and Knock-out tournaments.

6. Why is Committee Formation essential in event management?

7. Explain Hostile Aggression with a sports example.

8. State two differences between Intramural and Extramural events.

LEVEL-3 (4 MCQs)

1. A team is considered highly conscientious. Which behaviour best reflects this trait during a tournament?
 (a) Losing focus after minor setbacks
 (b) Following scheduled practice sessions strictly
 (c) Frequent conflict with teammates
 (d) Taking impulsive on-field decisions

