



BIRLA PUBLIC SCHOOL GANGANAGAR

(A UNIT OF BIRLA EDUCATION TRUST PILANI)



CBSE Affiliation No. 1730974

-A Step Ahead...

Session: 2026-27

GRADE 'XII' HOLIDAYS HOMEWORK



“An upcoming vacation gives us something to eagerly anticipate.”

As the much-awaited summer break is at our doorsteps, hope you have planned to spend time with family, explore new ideas, add value to your household and community. While every child deserves their time to relax and recover from the stresses of school, it is also important not to let grains of time pass aimlessly. To keep your brain occupied your teachers have created a homework pack incorporating activities that will help stretch your imagination, unravel creativity, and crystalize learnt concepts.

General Instructions:

Welcome to your English holiday homework plan! This plan is designed to keep you engaged and learning during the break while exploring various aspects of English literature and language. Here are the instructions and guidelines for completing your holidays homework:

- Review the weekly tasks and instructions provided. Make what is expected of you for each assignment.
- Keep track of deadlines, materials needed for each task, and any additional resources provided. Organization will help you manage your time effectively and produce high-quality work.
- Approach each task with enthusiasm and creativity. Take the opportunity to explore new ideas, express yourself through writing, and analyze literature from different perspectives.
- If you have any questions or need clarification on any aspect of the homework plan, don't hesitate to reach out to your teacher or classmates for assistance.

- Take time to reflect on your progress and the skills you've developed throughout the holiday homework period. Consider what you've learned and how you can apply it in the future.
- Ensure that your final presentation is well-organized, clear, and reflects the effort you've put into each task. Pay attention to details such as spelling, grammar, and presentation format.
- Importantly, enjoy the process of learning and exploring new topics in English literature and language. Use this opportunity to deepen your understanding and appreciation of the subject.

Week 1: Genre Exploration

Day 1: Discover a Genre

Task: Choose a literary genre you've never explored before.

Clue:

- **If you enjoy adventures, consider diving into magical realism, where the ordinary meets the fantastical in everyday life.**
- **Explore options:** Research different literary genres to find one you've never explored.
- **Learn about the genre:** Read about the origins and key characteristics of the genre.
- **Choose a book:** Select a book that is often cited as a defining example of the genre.
- **Start reading:** Begin reading the chosen book to familiarize yourself with the genre's style and themes.
- **Reflect:** Consider how the setting, characters, and plot elements contribute to the genre's unique characteristics.
- **Explore further:** Look for other books, movies, or works of art within the genre to deepen your understanding.
- **Share insights:** Discuss your discoveries with classmates, friends, or family members who share your interest in literature.

Day 2: Research

Task: Research the origins and key characteristics of this genre.

Clue:

- **Look up the first major work published in this genre; what historical or social conditions influenced its development.**
- **Select a topic:** Choose a subject or area of interest to research.
- **Gather information:** Use reliable sources such as books, articles, and websites to gather information about your topic.
- **Take notes:** Take detailed notes on key points, facts, and findings related to your research.
- **Organize your findings:** Arrange your notes in a logical order to help you understand and analyze the information.
- **Analyze the data:** Review and analyze the data you've collected to draw conclusions and identify trends or patterns.
- **Draw conclusions:** Use your analysis to draw conclusions and form opinions about your topic.
- **Cite your sources:** Be sure to cite the sources you used in your research to give credit to the original authors and avoid plagiarism.

Day 3: Reading Day

Task: Start reading a seminal text from this genre.

Clue:

- **Find a book that is often cited as a defining example of the genre—perhaps it won a significant literary award.**
- **Choose a book:** Select a book that is considered a defining example of the genre you're

exploring.

- **Start reading:** Begin reading the chosen book to immerse yourself in the genre's style and themes.
- **Take notes:** Make note of interesting quotes, characters, and plot developments as you read.
- **Reflect:** Pause periodically to reflect on how the book aligns with the characteristics of the genre.
- **Analyze:** Consider the author's writing style, character development, and thematic elements as you progress through the book.
- **Discuss:** Share your thoughts and impressions with classmates, friends, or family members who may have read the book or are interested in the genre.
- **Enjoy:** Allow yourself to enjoy the reading experience and be open to discovering new aspects of the genre through the book.

Day 4: Reflective Journal

Task: Write a reflective journal about your first impressions of the genre.

Clue:

- **Consider how the setting impacts the narrative. Does it alter your perception of the possible?**
- **Select pivotal moments:** Choose three significant events or experiences from your life.
- **Reflect on emotions:** Explore the feelings you experienced during each moment.
- **Consider lessons learned:** Think about the insights gained from each experience.
- **Reflect on personal growth:** Consider how each moment contributed to your development.
- **Write journal entries:** Record your thoughts and feelings for each moment.
- **Use prompts:** Use prompts to guide your reflection if needed.
- **Create a safe space:** Find a quiet place to reflect and write privately.

Day 5: Creative Conversion

Task: Convert a scene from your chosen text into a different genre.

Clue:

- **Imagine a key romantic scene written as a horror sequence. How would the descriptions and characters' reactions change?**
- **Select a scene:** Choose a scene from the book you're reading or a story you've recently enjoyed.
- **Choose a different genre:** Select a genre different from the original scene's genre.
- **Imagine the scene:** Picture how the scene would unfold in the new genre.
- **Adjust elements:** Modify the setting, characters, and plot elements to fit the new genre.
- **Write or visualize:** Write a short narrative or visualize the scene in your mind.
- **Consider impact:** Reflect on how the scene changes in the new genre and the impact it has on the story.
- **Share:** Share your creative conversion with others and discuss how the genre change alters the scene's interpretation.

Day 6-7: Weekend Project: Create a Mini-Documentary

Task: Create a mini-documentary about the genre using your findings and thoughts.

Clue:

- **Use examples of critical scenes to highlight how the genre's unique characteristics manifest. Consider including expert opinions or critical essays.**
- **Choose a topic:** Select a topic that interests you and that you'd like to explore further.
- **Plan your documentary:** Outline the key points you want to cover and decide on the structure of your documentary.

- **Gather materials:** Collect footage, interviews, images, and other resources related to your topic.
- **Film or create visuals:** Capture video footage or create visuals that illustrate your topic and support your narrative.
- **Edit your footage:** Use video editing software to compile and edit your footage into a cohesive documentary.
- **Add narration or interviews:** Record narration or include interviews with experts or people relevant to your topic.
- **Review and finalize:** Review your documentary and make any necessary edits or adjustments to ensure clarity and coherence.
- **Share your documentary:** Share your mini-documentary with friends, family, or classmates, and invite them to provide feedback.

Week 2: My Story Begins

Day 1-2: Autobiographical Timeline

Task: Create a visual timeline of significant events in your life, from childhood to the present day.

Instructions:

- **Use photographs, drawings, or symbols to represent key milestones, memories, and turning points.**
- **Gather materials:** Collect photos, drawings, or symbols representing significant life events.
- **Choose key events:** Reflect on important milestones and experiences from childhood to the present.
- **Create the timeline:** Draw a horizontal line representing your life span, and mark events chronologically.
- **Add events:** Place photos or symbols along the timeline, with brief descriptions.
- **Reflect:** Consider the emotions and lessons associated with each event.
- **Personalize:** Add creative touches to make the timeline your own.
- **Display and share:** Showcase your timeline and invite others to explore your life story.

Day 3-4: Reflective Journaling

Task: Write reflective journal entries about three pivotal moments in your life.

Instructions:

- **Choose three pivotal moments:** Select significant events from your life.
- **Reflect on emotions:** Explore the feelings you experienced during each moment.
- **Consider lessons learned:** Think about the insights gained from each experience.
- **Reflect on personal growth:** Consider how each moment contributed to your development.
- **Write journal entries:** Record your thoughts and feelings for each moment.
- **Use prompts:** Use prompts to guide your reflection if needed.
- **Create a safe space:** Find a quiet place to reflect and write privately.

Day 5-6: Family Oral History Project

Task: Interview a family member about their life experiences and personal stories.

Instructions:

- **Record the interview and transcribe key excerpts. Reflect on how their narratives contribute to your understanding of family history and heritage.**
- **Choose a family member:** Select someone to interview about their life experiences.
- **Prepare questions:** Create a list of questions covering their childhood, significant events, and memories.
- **Schedule and record:** Set a time for the interview and record it using a device.
- **Transcribe:** Write down key points and memorable quotes from the interview.

- **Reflect:** Consider the significance of the stories shared.
- **Share:** Share the oral history with family members.
- **Express gratitude:** Thank the family member for sharing the stories.

Day 7: Creative Writing: Ancestral Tales

Task: Write a short story or poem inspired by your family's cultural heritage or ancestral roots.

Instructions:

- **Draw upon family folklore, traditions, or migration narratives to create a fictionalized account that celebrates your cultural identity.**
- **Draw inspiration:** Reflect on your family's cultural heritage and ancestral roots.
- **Choose a theme:** Select a theme or aspect of your family history to explore in your story.
- **Create characters:** Develop characters inspired by your ancestors or family traditions.
- **Craft your story:** Write a short story or poem based on your chosen theme and characters.
- **Incorporate cultural elements:** Include cultural motifs, traditions, or values in your narrative.
- **Explore emotions:** Reflect on the emotions and experiences of your characters.
- **Edit and revise:** Review your writing and make any necessary edits or revisions.
- **Share your story:** Share your ancestral tale with family members or friends.

Week 3: Literary Exploration

Day 1-2: Creative Activity

- Create a 'Character Scrapbook' for one of the main characters in the novel or play you choose.
- Gather images, quotes, and descriptions that represent the character's personality, motivations and relationships.

Instructions:

- ✓ Use scrapbooking materials or digital tools to design an aesthetically pleasing layout.
- ✓ Write brief annotations explaining why each item was chosen and its significance to the character.

Day 3-4: Interactive Task

- Host a 'Literary Tea Party' inspired by scenes or themes from the book.
- Decorate your space with props and decorations that reflect the setting or atmosphere of the story.
- Click photographs and paste them in your scrap-book.

Instructions:

- ✓ Prepare snacks and beverages that relate to the characters or events in the book (eg. Serving Southern-style treats for 'To kill a Mockingbird')
- ✓ Discuss key moments in the story while enjoying your tea party, sharing insights and interpretations with family or friends.

Day 5-7: Creative Writing Prompt

- Write a series of 'Found Poems' using passages or dialogues from the novel or play.
- Select excerpts that resonate with you or capture important themes, emotions, or imagery.

Instructions:

- ✓ Rearrange the selected text to create new poems, experimenting with line breaks, punctuation, and rhythm.
- ✓ Reflect on how the process of found poetry deepens your understanding of the text and its literary elements.

Student No.	Genre Exploration (Week 1)	My Story Begins (Week 2)	Literary Exploration (Week 3)	Final Project (6-10 A4 Pages) Combined
1	Magical Realism	Autobiographical Timeline	Character Scrapbook	Explore magical realism through <i>One Hundred Years of Solitude</i> , create a personal timeline, and design a scrapbook for a chosen character.
2	Gothic Fiction	Reflective Journaling	Literary Tea Party	Research Gothic fiction using <i>Frankenstein</i> , write three reflective entries, and host/design a Gothic-themed tea party.
3	Dystopian Fiction	Family Oral History	Found Poetry	Study dystopian literature through <i>1984</i> , interview a family member, and create found poems from the novel.
4	Historical Fiction	Family Migration Story	Character Scrapbook	Analyze <i>The Book Thief</i> , document family migration/history, and create a scrapbook for the narrator or protagonist.
5	Science Fiction	Ancestral Tale Writing	Literary Tea Party	Explore science fiction with <i>The Time Machine</i> , write an ancestral-inspired story, and design a futuristic literary tea party.
6	Detective Fiction	Personal Identity Scrapbook	Found Poetry	Investigate detective fiction via <i>The Hound of the Baskervilles</i> , create an identity scrapbook, and compose found poetry.
7	Fantasy Literature	Autobiographical Timeline	Literary Tea Party	Study fantasy themes using <i>The Hobbit</i> , prepare a life timeline, and organize a fantasy-themed tea party.
8	Mythological Fiction	Reflective Journaling	Character Scrapbook	Explore mythological fiction through <i>Percy Jackson & the</i>

				Olympians: The Lightning Thief, write reflective journals, and create a character scrapbook.
9	Horror Fiction	Family Oral History	Found Poetry	Read Dracula, collect oral family stories, and transform passages into poems.
10	Adventure Fiction	Family Migration Story	Literary Tea Party	Analyze adventure fiction with Treasure Island, trace migration roots, and create an adventure-themed tea gathering.
11	Romance Fiction	Ancestral Tale Writing	Character Scrapbook	Study romance literature using Pride and Prejudice, write a heritage-inspired story, and design a character scrapbook.
12	Satirical Fiction	Personal Identity Scrapbook	Found Poetry	Research satire through Animal Farm, make a personal scrapbook, and produce found poems.
13	Psychological Fiction	Autobiographical Timeline	Literary Tea Party	Explore psychological fiction using The Catcher in the Rye, prepare a life timeline, and organize a literary tea discussion.
14	Crime Fiction	Reflective Journaling	Character Scrapbook	Study crime fiction through Murder on the Orient Express, write reflective journals, and make a detective character scrapbook.
15	Classic Fiction	Family Oral History	Found Poetry	Read To Kill a Mockingbird, conduct a family interview, and create found poetry from selected passages.
16	Tragedy/Drama	Family Migration Story	Literary Tea Party	Analyze tragedy through Hamlet, explore family roots, and host a dramatic literary tea party.
17	Young Adult	Ancestral Tale	Character	Explore YA fiction with

	Fiction	Writing	Scrapbook	The Fault in Our Stars, write an ancestral tale, and prepare a scrapbook for a protagonist.
18	Survival Fiction	Personal Identity Scrapbook	Found Poetry	Study survival fiction through Life of Pi, create an identity scrapbook, and compose found poems.
19	Philosophical Fiction	Reflective Journaling	Literary Tea Party	Explore philosophical fiction using The Alchemist, write reflective entries, and design a symbolic tea party discussion.

Week 4: Creative Writing

Notice Writing Topics

1. You are the General Secretary of the Student Council of your school. The school administration has decided to organise a week-long “Digital Detox and Mindfulness Campaign” for students of classes IX–XII in response to the increasing dependence on social media and digital gadgets. Draft a notice informing students about the campaign schedule, activities, expert sessions, registration process, and participation guidelines.
2. As the President of the Heritage Club of your school, draft a notice informing students about an interschool “Youth Parliament on Cultural Preservation and Ethical Tourism” being organised in collaboration with the Department of Archaeology. Include details regarding eligibility, selection rounds, research themes, and submission deadlines.

Formal Invitation Topics

A. Card-Based Formal Invitation

Your school is hosting an International Educational Conclave on “Artificial Intelligence, Ethics, and the Future of Education” in collaboration with renowned universities and educational organisations. As the Principal of the institution, draft a formal invitation card inviting academicians, educationists, researchers, and parents to attend the conclave.

B. Letter-Based Formal Invitation

You are the Convenor of the Literary and Intellectual Forum of your school. Write a formal letter inviting a distinguished environmental activist and public speaker to deliver the keynote address at a national symposium on “Climate Change, Sustainable Development, and Youth Responsibility.” Request the guest to conduct an interactive session with students as well.

Replies to Formal Invitations

A. Reply to Card-Based Formal Invitation

You are a noted educationist who has received an invitation to attend an International Educational Conclave on “Artificial Intelligence, Ethics, and the Future of Education” as the

Guest of Honour. Draft a formal reply accepting the invitation and expressing your views on the importance of the theme.

B. Reply to Letter-Based Formal Invitation

You are a renowned environmental activist invited to address a national symposium on “Climate Change, Sustainable Development, and Youth Responsibility.” Draft a formal reply accepting the invitation and appreciating the institution’s initiative towards environmental awareness and youth engagement.

Subject - Physics

Chapter 1: Electric Charges and Fields

Chapter 2: Electrostatic Potential and Capacitance

CHAPTER 1: ELECTRIC CHARGES AND FIELDS

Important Definitions

- **Electric Charge:** Property of matter due to which it experiences electric force.
- **Coulomb’s Law:** Force between two charges is directly proportional to product of charges and inversely proportional to square of distance.
- **Electric Field (E):** Force experienced per unit positive charge.
- **Electric Field Line:** Imaginary line representing direction of electric field.
- **Electric Dipole:** Pair of equal and opposite charges separated by small distance.

Important Derivations

1. Coulomb’s Law
2. Electric Field due to Point Charge
3. Electric Field due to Dipole (Axial Position)
4. Gauss’s Law

Activities

- ✓ Rub a comb on dry hair and bring near paper bits → observe attraction
- ✓ Draw electric field lines for:
 - Single charge
 - Dipole

Case-Based Questions

Case: A dipole is placed in uniform electric field.

- What happens if aligned parallel?
- What happens if perpendicular?

PYQ (Previous Year Questions)

1. Define electric field intensity. (1 mark)
2. State Gauss’s Law. (2 marks)
3. Derive electric field due to infinite plane sheet. (3/5 marks)
4. Write properties of electric field lines.

CHAPTER 2: ELECTROSTATIC POTENTIAL & CAPACITANCE

Important Definitions

- **Electric Potential:** Work done per unit charge.
- **Potential Difference:** Difference in potential between two points.
- **Capacitance:** क्षमता of storing charge.
- **Dielectric:** Insulating material used to increase capacitance.

Important Derivations

1. Potential due to Point Charge
2. Relation between E and V
3. Capacitance of Parallel Plate Capacitor
4. Energy Stored in Capacitor

Activities

- ✓ Make a simple capacitor using:
 - Aluminium foil
 - Paper
 - Battery
- Observe charging & discharging

Case-Based Questions

Case: Capacitor connected to battery

- What happens when dielectric inserted?
- What happens when plate distance increases?

PYQ Questions

1. Define electric potential.
2. Derive expression for capacitance of parallel plate capacitor.
3. What is dielectric constant?
4. Explain energy stored in capacitor.

ART INTEGRATED PROJECT WORK (VERY IMPORTANT)

Suggested Investigatory Projects

1. To study various factors on which the internal resistance/EMF of a cell depends.
2. To study the variations in current flowing in a circuit containing an LDR because of a variation in (a) the power of the incandescent lamp, used to 'illuminate' the LDR (keeping all the lamps at a fixed distance). (b) the distance of an incandescent lamp (of fixed power) used to 'illuminate' the LDR.
3. To find the refractive indices of (a) water (b) oil (transparent) using a plane mirror, an equiconvex lens (made from a glass of known refractive index) and an adjustable object needle.
4. To investigate the relation between the ratio of (i) output and input voltage and (ii) number of turns in the secondary coil and primary coil of a self-designed transformer.
5. To investigate the dependence of the angle of deviation on the angle of incidence using a hollow prism filled one by one, with different transparent fluids.
6. To estimate the charge induced on each one of the two identical Styrofoam (or pith) balls suspended in a vertical plane by making use of Coulomb's law.
7. To study the factor on which the self-inductance of a coil depends by observing the effect of this coil, when put in series with a resistor/(bulb) in a circuit fed up by an A.C. source of adjustable frequency.
8. To study the earth's magnetic field using a compass needle -bar magnet by plotting magnetic field lines and tangent galvanometer.

Class -XII (Chemistry)

Q1. Chlorobenzene on treatment with sodium in dry ether gives diphenyl. The name of reaction is :

- (a) Wurtz reaction (b) Wurtz-Fittig reaction
(c) Fittig reaction (d) Sandmeyer's reaction

Q2. Chemical formula of phosgene is

- (a) COCl_2 (b) CaOCl_2 (c) CaCO_3 (d) COCl

Q3. The most suitable reagent for the conversion $\text{CH}_3\text{CH}_2\text{OH}$ can be converted into CH_3CHO by.....

- (a) catalytic hydrogenation (b) treatment with LiAlH_4
(c) treatment with pyridinium chlorochromate (d) treatment with KMnO_4

Q4. Which of the following give positive iodoform test?

- (1) Ethanol (2) Ethanal (3) Butan-1-ol (4) Butan-2-ol (5) Phenyl ethanol

- (a) 1,2 and 4 (b) 1,3 and 4 (c) 1,2 and 3 (d) 1,2 and 5

Q5. Which of the following is most acidic?

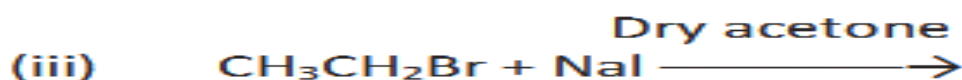
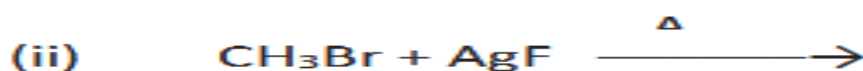
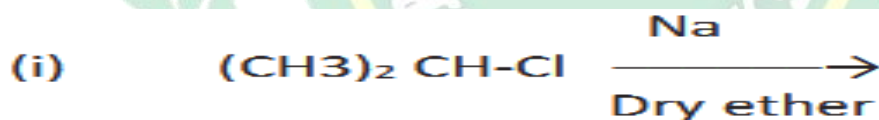
- (a) Benzyl alcohol (b) Cyclohexanol (c) Phenol (d) m-Chlorophenol

Q6. Arrange the following compounds in increasing order of boiling points:

Propan-1-ol, Butan-1-ol, Butan-2-ol, Pentan-1-ol

- (a) Propan-1-ol, Butan-2-ol, Butan-1-ol, Pentan-1-ol
(b) Propan-1-ol, Butan-1-ol, Butan-2-ol, Pentan-1-ol
(c) Propan-1-ol, Pentan-1-ol, Butan-2-ol, Butan-1-ol,
(d) Pentan-1-ol, Butan-1-ol, Butan-2-ol, Propan-1-ol

Q7. Write the formula of the main product formed in the following chemical reactions.



Q8. (a) An organic compound 'A' on treatment with KCN gave B which on hydrolysis with dil. HCl gave acetic acid. Identify A.

(b) An alkyl halide having molecular formula $\text{C}_4\text{H}_9\text{Cl}$ is optically active. What is its structure ?

(c) Which of the following two compounds would react faster by $\text{S}_\text{N}2$ path way :
1 - bromobutane or 2 - bromobutane and why.?

(d) Allyl chloride is more reactive than n - propyl chloride towards nucleophilic substitution reactions. Explain why?

(e) Arrange the following halides in the order of increasing $\text{S}_\text{N}2$ reactivity:



Q9. Primary alkyl halide $\text{C}_4\text{H}_9\text{Br}$ (A) reacted with alcoholic KOH to give compound

(B). Compound (B) is reacted with HBr to give (C) which is an isomer of (A). When (A) is reacted with sodium metal it gives compound (D), C_8H_{18} which is different from the compound formed when n-butyl bromide is reacted with sodium. Identify A, B, C and D and write the equations for all the reactions

Q10. (a) What is a Lucas reagent?

(b) Out of o-nitro phenol and p-nitro phenol which is more acidic and why?

(c) Name the reagent needed for oxidation of primary alcohol to carboxylic acid.

(d) What is usually added to ethyl alcohol to make it unfit for drinking purposes?

(e) Give a chemical test to distinguish between Methanol and Ethanol

Q11. Give the following name reactions.

(a) WOLF-KISHNER REDUCTION

(b) CANNIZARO REACTION

Q12. Draw the Structure and write the IUPAC name of following compounds:

(a) Salicylic acid

(c) Aspirin

(b) Acetophenone

(d) Benzoyl Chloride

Q13. Aldehydes and ketones both contain carbonyl group. Carboxylic acids contain $-COOH$ group but do not give reactions of carbonyl group except formic acid. Aldehydes and ketones having α -H atom undergo aldol condensation. Acids having α -H atom undergo HVZ reaction. Aldehydes and ketones undergo nucleophilic addition reactions. Aldehydes are more easily oxidized than ketones.

(a) Out of Acetic acid and Propanoic acid, which is more acidic and why?

(b) Why both the C-O bonds in carboxylate ions are equivalent?

(c) What happens when Ethanal reacts with dil. NaOH followed by heating?

(d) Among Benzoic acid and p-Nitro benzoic acid which is more acidic? Give reason.

[Investigatory project \(Art integrated projects\)](#)

1. Write neatly and legibly. Use a **black and blue pen** for all the text (avoid coloured pens, unless specifically required).
2. Avoid **cutting, overwriting**, or using **correction fluid**.
3. **Margins:** Maintain equal margins on both sides of the page. This helps in keeping the work organized.
4. **Page Numbering:** Number your pages at the bottom-centre or bottom-right corner for easy reference.

Following things must be included in your project

1. Title Page

2. Certificate
3. Acknowledgment
4. Table of Contents (Index)
5. Main Content (Introduction, Objective, Materials, Methods, Results, Discussion, Conclusion)
6. Summary
7. Diagrams and Pi-Charts, Mnemonics (if applicable)
8. Bibliography



S.No.	Project name	Student Name
1	Chemical Kinetics	Aanya
2	Biomolecules	Chitrakshi
3	Chemical properties of Haloalkane and Haloarenes	Devika
4	Electrochemistry	Dheeraj
5	Study of Chemical properties of alcohol, phenol , ethers	Harsh Hari Nandan
6	Study of physical and chemical properties of aldehyde and ketones	Khushi
7	Study of solution and factors affecting	Mananvjeet
8	Colligative properties of solutions	Rajat Kasnia
9	Coordination Compounds	Shrishtika

Subject - BIOLOGY

Answer the following questions

- Q1.** Name the pattern of inheritance where F_1 phenotype
 (i) resembles only one of the two parents.
 (ii) does not resemble either of the two parents and is in between the two.
- Q2.** Name the respective pattern of inheritance, where F_1 phenotype
 (i) does not resemble either of the two parents and is in between the two.
 (ii) resembles only one of the two parents
- Q3.** State a difference between a gene and an allele.
- Q4.** (i) Name the stage of cell division where segregation of an independent pair of chromosomes occurs.
 (ii) Name the event during cell division cycle that results in the gain and loss of chromosomes.
- Q5.** When does a geneticist need to carry a test cross?
 Or
 How would you find the genotype of an organism exhibiting a dominant phenotype?
- Q6.** Write the scientific name of the fruitfly. Why did Morgan prefer to work with fruit flies for his experiments? State any three reasons.
- Q7.** Give an example of a gene responsible for multiple phenotypic expressions. What are such genes called? State the cause that is responsible for such an effect?

Q8. Why are F₂ phenotypic and genotypic ratios are same in a cross between red flowered snapdragon and white flowered snapdragon plants? Explain with the help of cross.

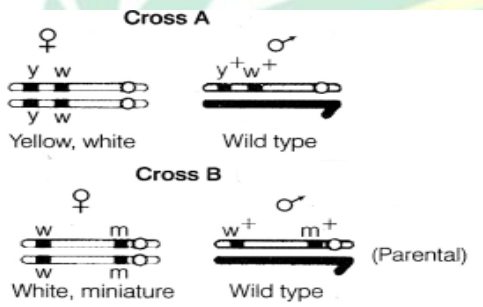
Q9. With the help of one example, explain the phenomena of codominance and multiple allelism in human population.

Q10. In snapdragon, a cross between true-breeding red flowered (RR) plants and true-breeding white flowered (rr) plants showed a progeny of plants with all pink flowers.

(i) The appearance of pink flowers is not known as blending. Why?

(ii) What is this phenomenon known as?

Q11. Study the figures given below and answer the question.



Q12. In a dihybrid cross, white-eyed, yellow-bodied female Drosophila crossed with red-eyed, brown-bodied male Drosophila produced in F₂-generation 1.3% recombinants and 98.7% progeny with parental type combinations. This observation of Morgan deviated from Mendelian F₂-phenotypic dihybrid

ratio. Explain, giving reasons Morgan's observation

Q13. Write the chromosomal basis of sex-determination in birds.

Q14. Why do normal red blood cells become elongated and sickle-shaped in structure in a person suffering from sickle-cell anaemia?

Q15. A cross between a normal couple resulted in a son who was haemophilic and a normal daughter. In course of time, when the daughter was married to a normal man, to their surprise, the grandson was also haemophilic.

(i) Represent this cross in the form of a pedigree chart. Give the genotypes of the daughter and her husband.

(ii) Write the conclusion you draw from the inheritance pattern of this disease.

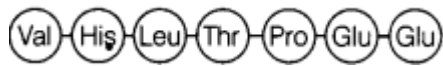
Q16. A colourblind child is born to a normal couple. Work out a cross to show how it is possible. Mention the sex of this child.

Q17. Differentiate between male and female heterogamety.

Q18. Identify a, b, c, d, e and / in the table given below

Syndrome	Cause	Characteristics of affected individual	Sex Male/ Female/ Both
Down's	Trisomy of 21	a (i), (ii)	b
c	XXY	Overall masculine development	d
Turner's	45 with XO	e (i) (ii)	f

Q19. A relevant portion of (3-chain of haemoglobin of a normal person is given below

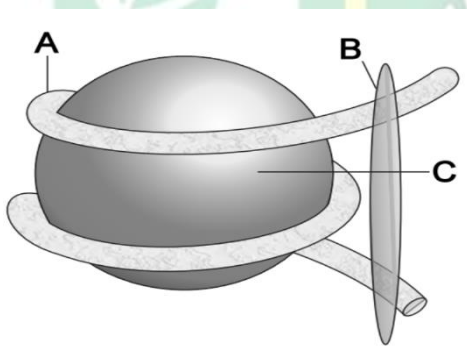


The codon for the sixth amino acid is GAG. The sixth codon GAG mutates to GAA as a result of mutation 'A' and to GUG as a result of mutation 'B'. Haemoglobin structure did not change as a result of mutation 'A', whereas haemoglobin structure changed because of mutation 'B' leading to sickle-shaped RBCs.

Explain giving reasons how could mutation 'B' lead to sickle-shaped RBCs. Explain giving reasons how could mutation 'B' change the haemoglobin structure or bring down mutation and not mutation 'A'.

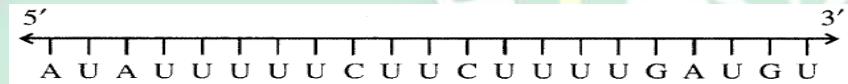
Q20. In a DNA segment, cytosine is 22%. Find out the percentage of adenine, thymine and guanine.

Q21. Identify the structure given below. Label A, B and C.

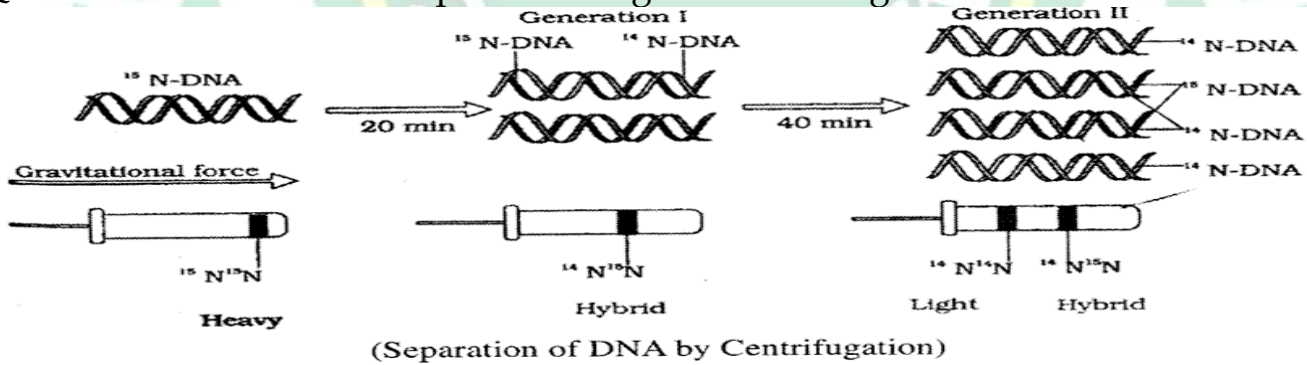


Q22. Read the sequence of codon in the mRNA

unit.



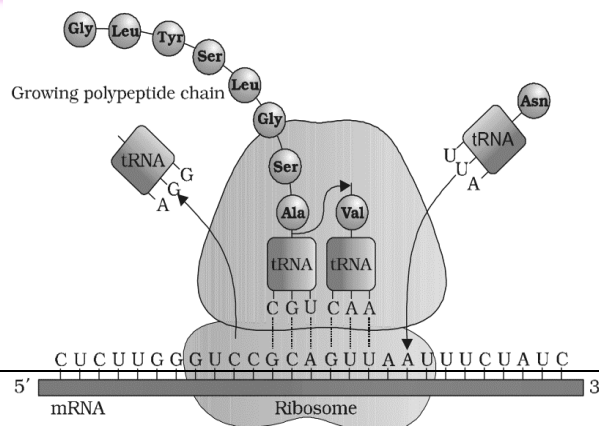
Q23. Results of a famous experiment is given in the figure below



- Identify the experiment.
- Which property of DNA is proved by experiment?

Q24. Observe the diagram and answer the question.

- Identify the process and its site.
- What is the role of mRNA and tRNA in this process?



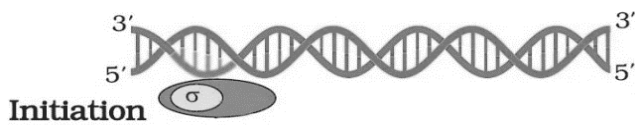
Q25. A transcription unit is given below.



Observe it and answer the question.

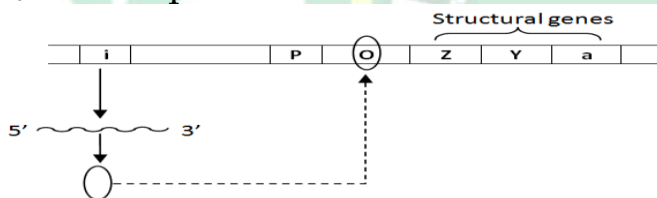
- How can you identify the coding strand?
- Write the sequence of RNA formed from this unit.
- What would happen if both strands of DNA act as template for transcription?

Q26. Given below is the diagrammatic representation of the first stage of a process in a bacterium.



- Identify the process.
- Name the enzyme that catalyses this process.
- What are the additional complexities in eukaryotes in this process?

Q27. Lac operon in the absence of inducer (Lactose) is given.



- What is 'P'?
- Name the enzyme produced by the structural genes 'Z', 'Y', and 'A'.
- Redraw the diagram in the presence of an inducer.

Q28. A small fragment of a skin of a different person was extracted from the nails of a murdered person. This led the crime investigators to the murderer.

- What technique was used by the investigators?
- What is the procedure involved in this technique?

Q29. According to the Hardy-Weinberg principle, the allele frequency of a population remains constant. How do you interpret the change of frequency of alleles in a population?

Q30. Anayaa told her younger brother that forelimbs of man and cheetah are structurally similar, though they perform different functions.

Do you agree with Anayaa? Give an example of such organs from the plant world.

Art Integration Project

Prepare one art integrated project accordingly

- Aanya Singh- Evolution through fossils
- Chitrakshi Mahawar- From Ape to man- The Evolution Story
- Dheeraj Kasnia- Origin of life
- Shristika- DNA Model

Investigatory Project

Prepare one investigatory project file of your interest.

Practical file

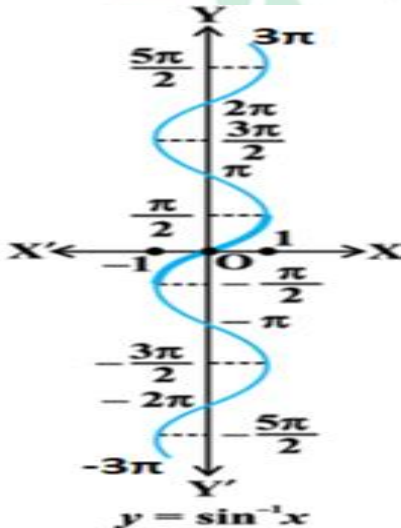
Complete your practical file.



ESTD. 2019

Subject -Mathematics

1	Check the injectivity and surjectivity of the below function: $f : \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = x^2$
2	If $f : \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = x^2 - 3x + 2$, find $f(f(x))$.
3	Let $A = \{-1, 0, 1, 2\}$, $B = \{-4, -2, 0, 2\}$ and $f, g : A \rightarrow B$ be the functions defined by $f(x) = x^2 - x, x \in A$ and $g(x) = 2\left x - \frac{1}{2}\right - 1, x \in A$. Are f and g equal? Justify your answer. (Hint: One may note that two functions $f : A \rightarrow B$ and $g : A \rightarrow B$ such that $f(a) = g(a) \forall a \in A$, are called equal functions).
4	Let $A = \{1, 2, 3, 4\}$ and $R = \{(1,1), (2,2), (3,3), (4,4), (1,2), (1,3), (3,2)\}$. Show that R is reflexive and transitive but not symmetric.
5	If A is a square matrix such that $A^2 = I$, then find the simplified value of $(A - I)^3 + (A + I)^3 - 7A$.
6	Find the value of $\tan^{-1}\left(\tan\frac{2\pi}{3}\right)$.
7	For the principal value, evaluate $\cot[\sin^{-1}\{\cos(\tan^{-1}1)\}]$
8	Prove that $\sin^{-1}(2x\sqrt{1-x^2}) = 2\cos^{-1}x, \frac{1}{\sqrt{2}} \leq x \leq 1$.
9	Find the value of $\sin\left[2\cot^{-1}\left(\frac{-5}{12}\right)\right]$
10	find the principle value : $\cot^{-1}(\sqrt{3})$
11	Construct a 3×2 matrix whose elements are given by $a_{ij} = (i + 2j)$.
12	Construct a 3×4 matrix, whose element are given by $a_{ij} = \frac{1}{2} -3i + j $
13	For two matrices A and B , $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$ verify that $(AB)^T = B^T A^T$.
14	If $A_\alpha = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, then prove that $A_\alpha A_\beta = A_{\alpha+\beta}$
15	Let $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$. Find each of the following: $A + B$ $A - B$
16	A trust fund has Rs30,000 that must be invested in two different types of bond. The first bond pays 5% interest per year and the second bond pays 7% interest per year. Using matrix multiplication, determine how to divide Rs30,000 in two types of bonds, if the trust fund must obtain an annual interest of (a) Rs1800, (b) Rs 2000.
17	Prove that the function, $f : \mathbb{N} \rightarrow \mathbb{N}$ is defined by $f(x) = x^2 + x + 1$ is one-one but not onto. Find inverse of $f : \mathbb{N} \rightarrow S$, where S is range of f .
18	If $A = \{1, 2, 3, \dots, 9\}$ and R is the relation in $A \times A$ defined by $(a, b) R(c, d)$, if $a + d = b + c$ for $(a,b), (c, d)$ in $A \times A$. Prove that R is an equivalence relation. Also, obtain the equivalence class $[(2, 5)]$.
19	Check if the relation R defined in the set $\{1, 2, 3, 4, 5, 6\}$ as $R = \{(a, b) : b = a+1\}$ is reflexive, symmetric or transitive.
20	Prove that the relation R in set $A = \{1, 2, 3, 4, 5\}$ given by $R = \{(a, b) : a - b \text{ is even}\}$ is an equivalence relation.

21	Find the value of $\tan^{-1}(1) + \cos^{-1}\left(-\frac{1}{2}\right) + \sin^{-1}\left(-\frac{1}{2}\right)$
22	Compute AB and BA , if exists when $A = \begin{bmatrix} -1 & 1 \\ -2 & 2 \\ -3 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & -2 & 1 \\ 0 & 1 & 2 \\ -3 & 4 & -5 \end{bmatrix}$
23	If $A = \begin{bmatrix} 2 & -1 & 3 \\ -4 & 5 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & -2 \\ 1 & 5 \end{bmatrix}$ then find AB and BA . Show that $AB \neq BA$
24	Find the values of x, y, z if the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$, satisfy the equation $A'A = I_3$
25	If $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 4 \\ -1 & 7 \end{bmatrix}$, find $(3A^2 - 2B + I)$.
26	<p>Read the following text carefully and answer the questions that follow:</p> <p>A relation R on a set A is said to be an equivalence relation on A iff it is</p> <p>Reflexive i.e., $(a, a) \in R \forall a \in A$.</p> <p>Symmetric i.e., $(a, b) \in R \Rightarrow (b, a) \in R \forall a, b \in A$.</p> <p>Transitive i.e., $(a, b) \in R$ and $(b, c) \in R \Rightarrow (a, c) \in R \forall a, b, c \in A$.</p>
27	<p>Read the following text carefully and answer the questions that follow:</p> <p>Today in the class of Mathematics, Mrs. Pandey is explaining the inverse trigonometric function. She draws the graph of the $\sin^{-1} x$ and write down the following about the principal value of branch function $\sin^{-1} x$:</p> <p>Principal value of branch function $\sin^{-1} x$: It is a function with domain $[-1, 1]$ and range $\left[-\frac{3\pi}{2}, -\frac{\pi}{2}\right], \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ or $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$ and so on corresponding to each interval, we get a branch of the function $\sin^{-1} x$. The branch with range $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ is called the principal value branch. Thus, $\sin^{-1} x$:</p> <p>$[-1, 1] \rightarrow \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$</p>  <p>$y = \sin^{-1}x$</p>
	Find the domain of $\sin^{-1} \sqrt{x-1}$.
	Find the domain of $\sin^{-1} [x]$.

Find the value $\sin \left[\frac{\pi}{3} - \sin^{-1} \left(-\frac{1}{2} \right) \right]$.

The principal value of $\cos^{-1} \left(\cos \frac{2\pi}{3} \right) + \sin^{-1} \left(\sin \frac{2\pi}{3} \right)$ is π .

28 **Read the following text carefully and answer the questions that follow:**

In a city, there are two factories A and B. Each factory produces sports clothes for boys and girls. There are three types of clothes produced in both the factories, type I, II and III. For boys, the number of units of types I, II, and III respectively are 80, 70, and 65 in factory A and 85, 65, and 72 are in factory B. For girls the number of units of types I, II, and III respectively are 80, 75, 90 in factory A and 50, 55, 80 are in factory B.



Represent the number of units of each type produced by factory A for both boys and girls and number of units of each type produced by factory B for both boys and girls in matrix form. (1)

Find the total production of sports clothes of each type for boys. (1)

Find the total production of sports clothes of each type for girls. (2)

OR

Let R be a 3×2 matrix that represent the total production of sports clothes of each type for boys and girls, then find the transpose of R. (2)

29 Show that the function $f : \mathbb{R} - \{3\} \rightarrow \mathbb{R} - \{1\}$ given by $f(x) = \frac{x-2}{x-3}$ is a bijection.

30 If $A = \begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 3 \\ 3 & -4 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 \\ -1 & 0 \end{bmatrix}$, verify

$$(AB)C = A(BC)$$

$$A(B + C) = AB + AC.$$

Maths : Art Integration Project

Type of Activity: individual

S.N	NAME OF STUDENT	PROJECT
1	AANYA SINGH	Application of Mathematical Patterns, Symmetry, and Geometrical Concepts through Various Art Media and Techniques
2	DEVIKA JHINJHA	Mathematical Study of Natural and Man-Made Forms Using Shapes, Proportions, Symmetry, and Spatial Visualization
3	HARSH HARI NANDAN	Exploration of Geometry and Measurement in Human Figures, Animals, Birds, Vegetation, and Everyday Objects
4	KHUSHI	Understanding Three-Dimensional Geometry through Modelling with Clay, Plaster of Paris, Wood, and Other Sculptural Materials
5	MANAVJEET SINGH	Application of Mathematical Contrast, Patterns, and Proportional Relationships in Visual Design
6	RAJAT KASNIA	Use of Transformations, Tessellations, and Repetitive Patterns in Printing and Design Techniques
7	SHRISHTIKA GOYAL	Study of Solid Shapes, Surface Structures, and Spatial Concepts through Basic Clay Modelling

Class XII – Computer Science (Python)

Dear Students,

As part of your **Computer Practical Work**, you are required to prepare a **Python Practical File** during the holidays.

👉 The practical file must be **strictly handwritten** in your practical notebook.

👉 Ensure that:

- Your handwriting is **neat, clear, and well-presented**
- Proper **headings and margins** are maintained
- The work is **systematic and well-organized**
- It should be done in **Practical file (Only)**

✦ This practical file will be considered for your **Practical**, so complete it sincerely and carefully.

Class 12 Python Program List

1. Program to print “Hello World”
2. Program to input name and display greeting
3. Program to find sum of two numbers
4. Program to check whether a number is even or odd
5. Program to find the largest of three numbers
6. Program to swap two numbers (with and without using a temporary variable)
7. Program to check whether a number is positive, negative, or zero
8. Program to check leap year
9. Program to calculate grade based on marks
10. Program to create a simple calculator using `if-elif`
11. Program to print numbers from 1 to N
12. Program to find sum of first N natural numbers
13. Program to print multiplication table of a given number
14. Program to find factorial of a number
15. Program to print Fibonacci series

Subject : Music

1. Art Integration Project (Music)

Objective:

To understand Naad Shruti Sawar Saptak Thaataal Jaati Teentaal Jhaptaal Chautaal Raag Bhairav Bhageshree Malkauns

Name-wise Topic Distribution :(Each student must make an individual Project.)

NAME	Topic
Anaya singh	Write Definition Naad ,Shruti , with type
Amitoj singh	Write Definition Sapat ,Thaat with type
Dinky Aggarwal	Write Definition of Sawar ,Sudha sawar Vikarit sawar Komal sawara tivra sawar
Gaivandeep singh	Write Definition Taal and Laya ,Aavartan, Sam ,Taali Khali Matra
Gursimran sikh	Description of Taal Jhaptaal along with Notation Single Dugun and Chaugun
Kabir Singh	Description of Raag Bhairav with Notation
Karanveer singh	Description of Raag Bhageshree with Notation
Mannat kaur	Description of Raag Malkauns with Notation

Subject: Psychology

Student Allotment of Topics for Project File-

Each student will work on one specific disorder:

1. Gaivandeep – Post-Traumatic Stress Disorder (PTSD)
2. Livanshi – Attention Deficit Hyperactivity Disorder (ADHD)

3. Kabir – Panic Disorder
4. Mannat – Substance Abuse Disorder
5. Dinky – Autism Spectrum Disorder (ASD)
6. Gursimran – Specific Phobia
7. Karan – Eating Disorders
8. Devika – Obsessive-Compulsive Disorder (OCD)
9. Khushi – Illness Anxiety Disorder

Project Format

Each student must prepare a handwritten file, including the following sections:

Section 1: Introduction to the Disorder

- Definition of the disorder
- Brief explanation
- Key features

Section 2: Detailed Information

1. Symptoms

- Emotional symptoms
- Behavioral symptoms
- Physical symptoms (if applicable)

2. Cycle of the Disorder

- Explanation of how the disorder develops and continues
- Use diagrams/flowcharts if possible

3. Impact of the Disorder

- Impact on daily life
- Impact on relationships
- Academic/work impact

4. Causes

- Biological factors
- Psychological factors
- Environmental/social factors

5. Treatment

- Therapies (e.g., counseling, CBT, etc.)
- Medication (if applicable)
- Lifestyle changes

6. Include Prognosis (expected outcome and recovery chances)

Section 3: Case Study (Hypothetical)

A. Basic Profile

- Name
- Age
- Gender
- Personal background

B. Personal & Health Details

- Physical health characteristics
- Mental health background

C. Socio-Economic Status

- Family background
- Education
- Financial condition

D. Nature of the Problem

- Description of the issue faced

- Duration and severity
- Case Study Structure
- Background Information
- Family history
- Early life experiences
- Symptoms Observed
- Clearly link symptoms to the disorder
- Diagnosis
- Explanation of how the disorder is identified
- Treatment Plan
- Suggested therapy/medication
- Coping strategies
- Outcome
- Improvement or challenges over time
- Conclusion
- Summary of the case
- Key learnings Section

4: Bibliography

- List of books, websites, or articles referred
- Must be written in a proper format

ESTD. 2019