Bal Bharati
PUBLIC SCHOOL
Sector 12, Dwarka

Dear Parent,

As we usher in the much awaited and cherished Summer Holidays, we are pleased to present the **Holiday Homework for the academic year 2024-25**. Our aim is to enrich and perpetuate critical reasoning, out-of-the-box thinking, and empathy among our students.

Aligned with the visionary tenets of the NEP 2020, our curated activities emphasise experiential, value-based, and project-based learning. This summer, we eagerly anticipate our students embarking on an immersive journey of self-discovery, where textbooks yield to hands-on experiences and real-world applications. Let us together embrace the ethos of NEP 2020, nurturing our students to recognize and harness their unique strengths and inherent potentials.

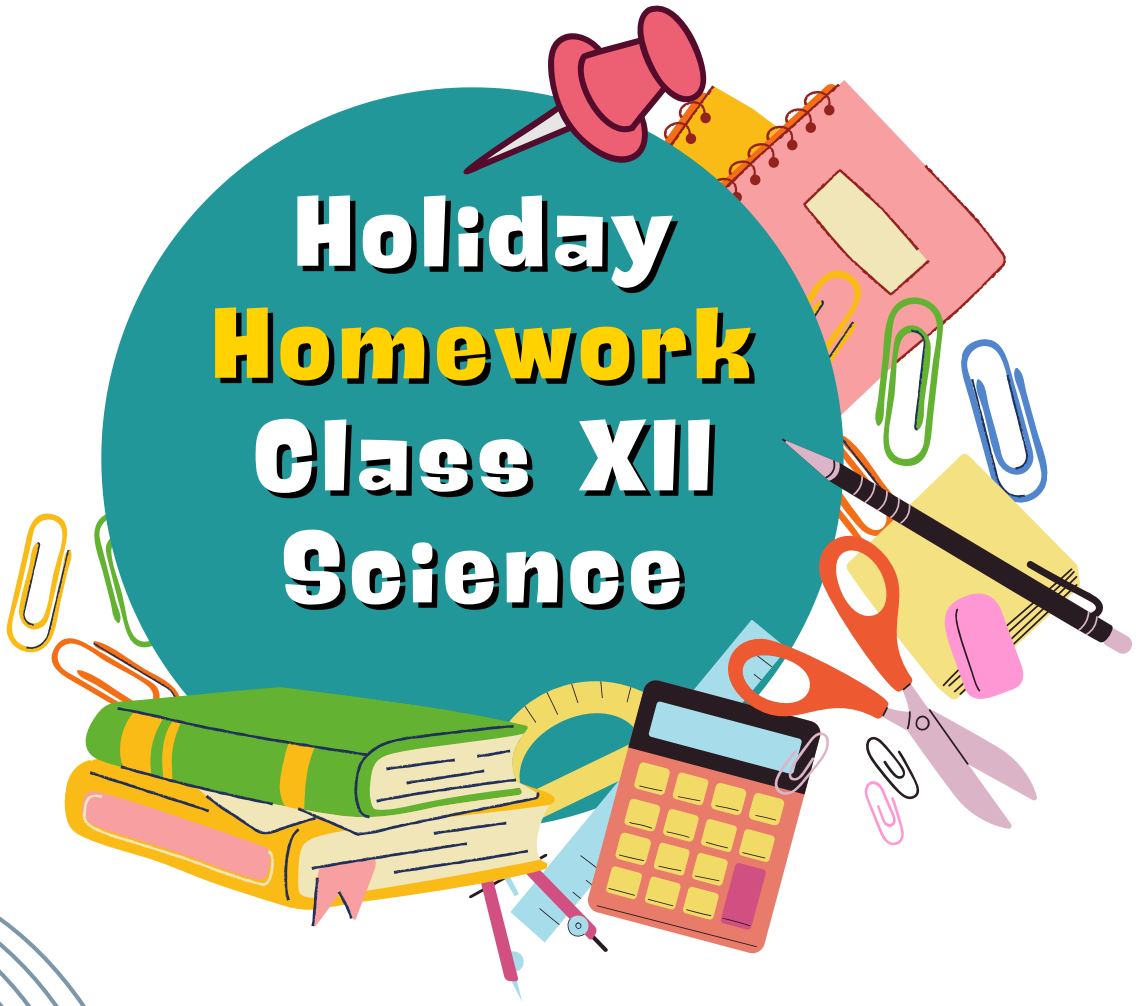
We extend our gratitude for your steadfast support in fostering holistic education.

Warm regards,

(Suruchi Gandhi)
Principal

Bal Bharati
PUBLIC SCHOOL
Sector 12, Dwarka

Holiday Homework
Class XII
Science



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PROJECT GUIDELINES (2024-2025)

SUBJECT	**ENGLISH**
MARKS FOR PROJECT (MARKING SCHEME)	20 MARKS ALS- 5+5 = 10 MARKS PROJECT WORK + VIVA- 10 MARKS
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	(HANDWRITTEN)
GROUP/INDIVIDUAL	INDIVIDUAL
LIST OF EXPERIMENTS/TOPICS	a) Interview Based Research Students can choose a topic of his/her choice on which to do their research/interview. ❖ The student then has to conduct interviews with a few neighbours on the topic. For an interview, with the help of the teacher, the student will frame questions based on the preliminary research/background. ❖ The student will then write an Essay/ Write up / Report etc. up to 1000 words on his/her Research and submit it. He/ She will then take a Viva on the Research Project. The Project has to be done in individually. b) Students listen to podcasts/ interviews/radio or TV documentary on a topic and prepare a report countering or agreeing with the speakers. Write an 800 – 1000 words report and submit. A Viva will be taken on the report.

GUIDELINES

- **The Objectives of the Project Work are to enable Learners:**
  - To check Planning, Preparation and Presentation along with various language skills through Research and Writing.
  - To activate their Listening Skills and create more horizon for the Creative Skillset**.**
- **The Expectations of the Project Work are:**
  - To develop Pronunciation and Intonation.
  - To check the students' grammatical structures and assess their communication skills so as to make the teacher understand their point of view effectively**.**
  - To assess Interactive Competence and Fluency while delivering the speech.
- **Scope of the Project:**
  - Quality of Content of Project.
  - Accuracy of Information
  - Adherence to the Specified Timeline
  - Content with respect of topic given
  - Clarity of thoughts and ideas
  - Creativity
  - Knowledge and experience gained

- **Expected Checklist:**
  - Cover Page, with Title of Project, School details/details of students.
  - Statement of Purpose/Objectives/Goals
  - Certificate of completion under the guidance of the teacher.
  - Students Action Plan for the completion of assigned tasks.
  - Materials such as scripts for the Questionnaires for Interview, Written Assignments, Essays, Survey-Reports and other material evidence of Learning Progress and Academic accomplishment.
  - The 800-1000 words Essay/Script/Report.
  - Student Reflections.
  - If possible, Photographs and Videos that capture the positive learning experiences of the students.
  - List of Resources/Bibliography.
- **Mode of Presentation/Submission of the Project:**
  - Each learner will present Research Work in the Project File.
  - The questions for the Viva Voce shall be asked from the Project File of the learner.
  - The practice of Listening and Speaking skills will be done throughout the Academic Session.
  - Viva Voce of the project file will check the following parameters:
    1. Fluency – Cohesion, Coherence and Speed of Delivery.
    2. Pronunciation – Grammar and Vocabulary.
    3. Interactive Competence – Initiation and relevance to the topic.

PROJECT WORK

1. **ASL PROJECT**: Students shall be required to prepare a Project (an Interview Based Research/Survey) and write a report, in accordance with the guidelines provided by CBSE.

2. **ASSIGNMENT**

a. Create an **Invitation** for your society, that has organised a Fitness Camp for two days for the residents as well as workers, along with their families. Draft a formal invitation, providing all the necessary details.

b. **Letter to the Editor** - You are Garv/ Garvita of 302, Shanti Niketan, Whitefield, Bangalore. You are deeply moved to hear trusted brands selling adulterated and contaminated food products.

Draft a **Letter to the Editor** in not more than 150 words, expressing great shock about the same and encouraging people to grow, produce and use organic products for a better lifestyle and longevity of the Human Body.

c. **Article** – Write an **Article** on the given topic in 150-200 words.

Teenagers, nowadays, are influenced by the glamour and superficiality of the virtual world but their real world is actually a dark shell where each suffers from an Identity Crisis.

d. **Watch** any one of the following **movies** and pen down a review concentrating on the plot, background, characterization, and theme in not more than 200 words.

a. The Little Prince

b. Rudy

c. The Great Debaters

d. The Pursuit of Happiness

SUBJECT	PHYSICS
MARKS FOR PROJECT (MARKING SCHEME)	1. Scientific Thought and feasible solution-3 marks 2. Creative, Resourcefulness and Inventiveness-5 marks 3. Research Skill-2 marks 4. Presentation-5 marks 5. Viva voce-5 marks Total Marks-20
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	HANDWRTTEN
GROUP/INDIVIDUAL	INDIVIDUAL
LIST OF EXPERIMENTS/TOPICS	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 a 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. • Any other topic based on concept of Physics

GUIDELINES

The objectives of the project work are to enable learners to:

- Engage in practical exploration and investigation of a specific area in Physics.

- Enhance understanding of a chosen topic through experimentation, analysis, and documentation.
- Develop problem-solving, critical thinking, and research skills by formulating hypotheses and drawing conclusions.
- Encourage curiosity and interest in Physics through a hands-on approach.

Expectations of the Project:

- A clear, focused research question or hypothesis to guide the investigation.
- A well-structured experimental plan that outlines the methodology, variables, and data collection techniques.
- Accurate data collection and analysis using appropriate tools and methods.
- Clear presentation of results, including data visualizations such as graphs, charts, or tables.
- A conclusion that summarizes the findings and suggests possible future research directions.
- Proper documentation of sources and references.

Scope of the Project:

- Projects can cover various topics in Physics such as electricity, thermodynamics, optics, electromagnetism, modern Physics and more.
- The project may involve designing experiments, simulations, or theoretical models to explore a specific concept.
- The project may be a solution of existing problems or an innovative application of any scientific principle.

Expected Checklist:

- Research Question: Clearly define the research question or hypothesis.
- Literature Review: Conduct background research and compile relevant information.
- Experimental Plan: Design the experiment, including materials, procedures, and data collection methods.
- Data Collection: Gather data accurately and systematically.
- Data Analysis: Analyze the data using appropriate statistical or graphical methods.
- Results: Present the results clearly, using graphs, charts, or tables as needed.
- Interpretation: Interpret the results in relation to the research question or hypothesis.
- Conclusion: Summarize the findings and suggest areas for further research.
- Documentation: Cite sources and references accurately.
- Presentation: Prepare the project for presentation.

Mode of Presentation:

- Written Report: A detailed report that includes the research question, literature review, experimental plan, data analysis, results, interpretation, and conclusion. Include proper citations and references.

- Digital Presentation: A digital format such as a PowerPoint or Google Slides presentation that covers the project's objectives, methodology, results, and conclusion. Include visual aids and interactive elements as appropriate.
- Demonstration: If the project involves an experiment or model, consider a live demonstration to illustrate the findings.

ASSIGNMENT

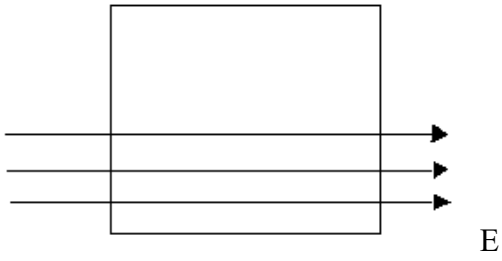
ELECTROSTATICS

Q1 Five Charges of equal amount (q) are placed at five corners of a regular hexagon of side 10 cm. What will be the value of sixth charge placed at sixth corner of the hexagon so that the electric field at the centre of hexagon is zero ?.

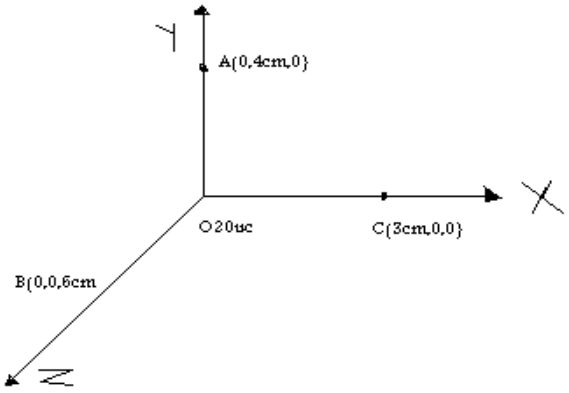
Q2 Two conducting spheres of radii r_1 & r_2 are at same potential. What is the ratio of charges on the spheres?

Q3 An electric charge q is placed at one of the corner of a cube of side 'a'. What will be the electric flux through its one of the face?

Q4 A square surface of side L meters is in the plane of the paper. A uniform electric field E (volts/m), also in the plane of paper, is limited only to lower half of the square as shown in the diagram. What will be the electric flux (in SI units) associated with the surface.



Q5 A charge of 10 μc is brought from point A (0,4 cm,0) to C (3 cm,0,0) via point B (0,0,6 cm) in vacuum. Calculate the work done if the charge at origin is 20 μc.



Q6 A charge Q is divided in two parts q and Q - q separated by a distance R. If force between the two charges is maximum, find the relationship between q & Q.

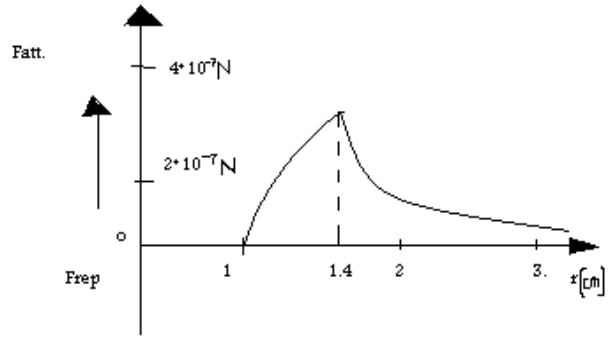
Q7 If N drops of same size, each having the same charge, coalesce to form a bigger drop. How will the following vary with respect to single small drop?

(i) Total charge on bigger drop

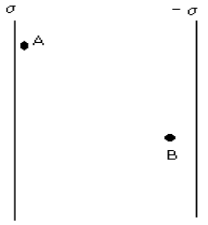
(ii) Potential on the bigger drop

(iii) The capacitance on the bigger drop

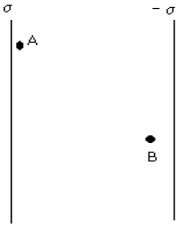
Q8 The graph shows the electric force of repulsion on tiny charged conducting sphere A, as a function of its separation from a sphere B. The sphere B has 10 times the charge on the sphere A. Explain the behaviour of the force between them at the separation 2cm and 1cm.



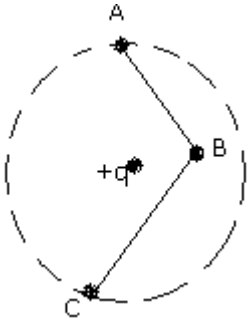
Q9 In a parallel plate capacitor the potential difference of 10^2V is maintained. What will be the electric field at points A and B?



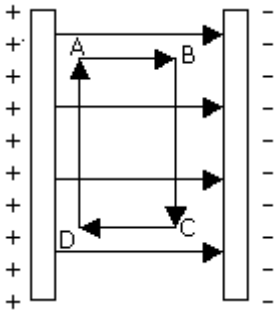
Q10 Two protons A and B are placed between two plates of a parallel plate capacitor having a potential difference V. Will these protons experience equal force?



Q11 Is a point charge +q is taken from A to C and then from C to B of a circle drawn with another point charge +q at center, then along which path work done is more?

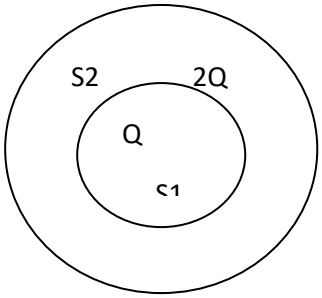


Q12 A uniform electric field E exists between 2 charged plates as shown in figure. What would be the work done in moving a charge q along the closed circular path ABCDA?



Q13 S1 and S2 are 2 hollow concentric spheres enclosing charges Q and 2Q as shown in figure. (i) What is the ratio of electric flux through S1 and S2? (ii) How will the

electric flux through sphere S1 change if a medium of dielectric constant 5 is introduced in the space inside S1 in place of air?



CURRENT ELECTRICITY

Q1. A copper wire of resistivity ρ is stretched to reduce its diameter to half its original value. What will be its new resistivity?

Q2 If potential difference applied across a conductor is increased from V to 2V, how would the drift velocity of the electrons change?

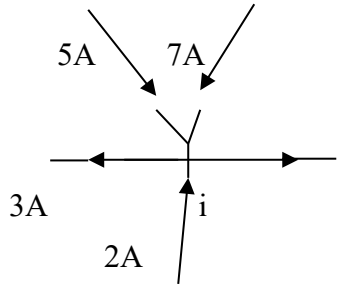
Q3. A carbon resistor is marked in colour bands or red, orange and silver. What is the resistance and tolerance value of the resistor?

Q4. Two wires one of manganin and the other of copper have equal length and equal resistance. Which one of these wires is thicker?

Q5. How does the electrical conductivity of an electrolyte change with the decrease of temperature?

Q6. When the wheatstone is bridge most sensitive?

Q7. What is the value of current in adjoining circuit?



Q8 Two wires X and Y have the same resistivity but their cross sectional areas are in the ratio 2:3 and lengths in the ratio 1:2. They are first connected in series and then in parallel to a d.c. source. Find out the ratio of drift speeds of the electrons in the two wires for the two cases.

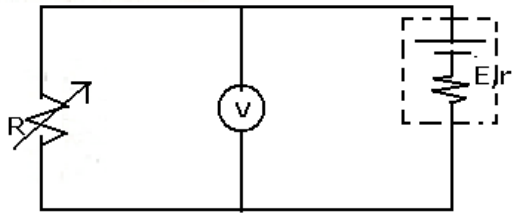
Q9 A cylindrical metallic wire is stretched to increase its length by 10%. Calculate the percentage increase in its resistance.

Q10 Draw graphs showing the variation of resistivity with temperature for (i) nichrome (ii) silicon (iii) copper (iv) carbon.

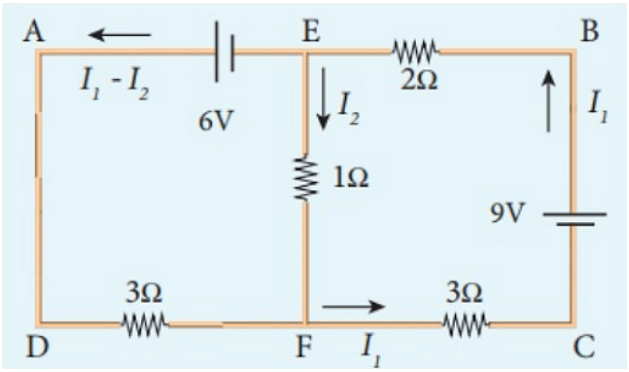
Q11 The potential difference V is applied across the ends of copper wire of length l and diameter D. What is the effect on drift velocity of electrons if (i) I is doubled (ii) D is doubled.

Q12 Why very small resistance can't be measured accurately using metre bridge?

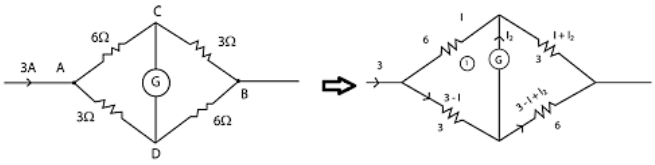
Q13 Figure below shows a cell of emf E and internal resistance r, connected to a voltmeter V and a variable resistance R. Deduce the relationship among V, E, R and r. How will V vary when R is reduced?



Q14 Calculate the current that flows in the 1 Ω resistor in the following circuit.



Q15 Find the equivalent resistance using Kirchoff's laws.



SUBJECT	CHEMISTRY
MARKS FOR PROJECT (MARKING SCHEME)	1.Clearly defined Aim 2. Knowledge Content/Research Work 3. Presentation Technique 4. Viva-voce Total : 5 Marks
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	HANDWRTTEN
GROUP/INDIVIDUAL	INDIVIDUAL
LIST OF EXPERIMENTS/TOPICS	1. To assess the feasibility and sustainability of biodiesel production and its potential as an alternative fuel source. 2. To analyze the composition and nutrient content of different commercial fertilizers. using methods like titration and spectrophotometry. Compare the results to label claims and recommend the most effective fertilizers. 3. To analyze the chemical composition of honey and its potential health benefits. 4. To determine the stoichiometry of a metal-ligand complex using Job's method . 5. To synthesize silver nanoparticles using a green method and characterize their size and stability using UV-visible spectroscopy. 6. To quantitatively determine the concentration of calcium in milk samples using titration methods. 7. To produce biodiesel from vegetable oil and assess its quality and efficiency as an alternative fuel. 8. To investigate the effectiveness of a photocatalyst in degrading organic dyes under UV light and understand the mechanism of photocatalytic degradation. 9. Formulation of cosmetic products like face serums, soaps, cold cream, and vanishing cream and itar etc 10. Study of the presence of oxalate ions in guava fruit at different stages of ripening. 11. Study of quantity of casein present in different samples of milk. 12. Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc. 13. Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.) 14. Study of digestion of starch by salivary amylase and effect of pH and temperature on it.

	15. Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc. 16. Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom). • 17. Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chilli powder and pepper and Make an app on to test the presence of adulterants using house hold items. 18. To investigate the effects of different dehydration methods on the nutritional content and quality of apples. Any other topic based on concepts of Chemistry

GUIDELINES

The objectives of the project work are to enable learners to:

- Engage in practical exploration and investigation of a specific area in Chemistry.
- Enhance understanding of a chosen topic through experimentation, analysis, and documentation.
- Develop problem-solving, critical thinking, and research skills by formulating hypotheses and drawing conclusions.
- Encourage curiosity and interest in Chemistry through a hands-on approach**.**

Expectations of the Project:

- learners will complete only ONE project in each academic session.
- Project should be of 2,000-3,000 words (excluding diagrams & graphs),
- Project should be hand-written.

Scope of the Project:

- Projects can cover various topics in Chemistry such as Electrochemistry, Chemical Kinetics, Cosmetic Chemistry, and more.
- The project may involve designing experiments, simulations, theoretical models, making apps to explore a specific concept.

The project may be a solution of existing problems or an innovative application of any scientific principle.

Key guidelines to follow while documenting the investigatory project:

1.INDEX : Maintain index, and neatly organized content with page numbers**.**

2. Title Selection : Choose a concise and descriptive title that reflects the purpose of your investigation.

3.Introduction: Provide a clear introduction to the topic, including the background information, significance of the study, and objectives of the project.

4. Review of Literature: Include a brief review of relevant literature and studies related to your topic to show understanding of existing knowledge.

5. Hypothesis- State a clear hypothesis or research question that you aim to investigate through your project.

6. Materials and Methods: Describe the materials (equipment, chemicals, biological specimens) and methods used in your experiment. Include detailed procedures in a step wise manner supported by pictures at each critical step.

7. Data Collection and Analysis- Record all data obtained during the experiment systematically. Use appropriate tables, graphs, and charts to present your findings**.**

8. Result: Present the results of your experiment objectively, including any statistical analyses performed.

9 Discussion - Interpret your results and discuss their implications. Compare your findings with existing literature and address any limitations or challenges encountered during the project.

10.Conclusion- Summarize the key findings of your investigation and how they relate to your hypothesis or research question. Give suggestions for further studies that can investigate other aspects not covered by this project.

11.Bibliography : Cite all sources of information used in your project, including books, journals, and websites links.

12. Acknowledge any individuals or institutions that provided assistance or resources for your project.

NOTE: It is important to conduct your investigation ethically and ensure that your project is well-documented and scientifically sound for presentation in the project file

Mode of Presentation/Submission of the Project:

At the end of the stipulated term, each learner will present the research work(Hand Written) in the Project File to the External and Internal examiner who will judge the project work on parameters given above .This may be supported by:

1.Digital Presentation: A digital format such as a PowerPoint/App / or Google Slides presentation that covers the project's objectives, methodology etc . Include visual aids and interactive elements as appropriate**.**

2. Demonstration: If the project involves an experiment or model or the sample of the cosmetics made etc , consider a live demonstration to illustrate the findings.

Expected Checklist:

• Introduction of topic/title

• Identifying the causes, consequences

• Various stakeholders and effect on each of them

• Advantages and disadvantages of situations or issues identified

• Short-term and long-term implications of strategies suggested during research

• Validity, reliability, appropriateness, and relevance of data used for research work and for presentation in the project file

• Presentation and writing that is succinct and coherent in project file

• Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.

ALDEHYDES KETONE AND CARBOXYLIC ACIDS

1.Give an example of a compound in which hydrogen bonding results in formation of a dimer.

2.Aldehydes are more reactive than ketones towards nucleophilic reagents. Give reason.

3.Why carboxylic acids do not give the characteristic reactions of carbonyl group?

4. Account for the following:

(i) Formaldehyde gives Cannizzaro ‘s reaction whereas acetaldehyde does not.

(ii) Chloroacetic acid has lower pKa value than acetic acid.

(iii) Electrophilic substitution in benzoic acid takes place at meta position.

(iv) Carboxylic acid have higher boiling point than alcohols of comparable molecular masses.

(v) Cyclohexanone forms cyanohydrin in good yieldbut2,2,6-trimethyl cyclohexanone does not.

(vi)The boiling point of aldehydes and ketones are lower than that of the corresponding acids and alcohols.

(vii)The aldehydes and ketones undergo a number of addition reactions.

(viii) Dipole moment of aldehydes and ketones are higher than those of alcohols.

(Ix) Di alkyl cadmium is considered superior to Grignard reagent for the preparation of ketone from acid chloride.

(x) Fluorine is more electronegative than chlorine, even then, p-flouoro benzoic acid is a weaker acid than p-chlorobenzoic acid.

(xi) Aldehydes form highly unstable hydrates, but chloral normally exists as chloral hydrate

(xii)

The image I below shows the Cannizzaro reaction using:

(i) formaldehyde

(ii) benzaldehyde

(iii) a mixture of benzaldehyde and formaldehyde.

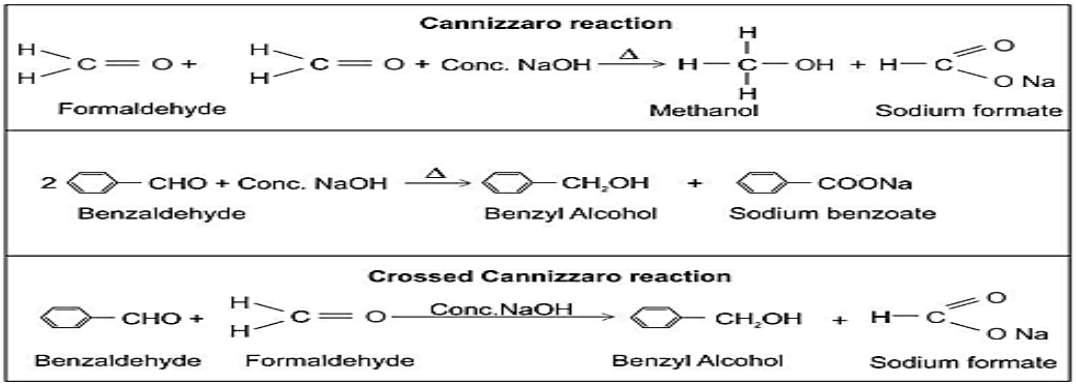
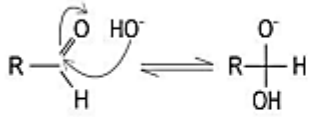


Image II shows the reaction mechanism of the reaction.

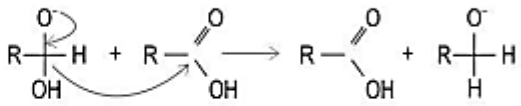
Cannizzaro reaction mechanism

Step 1 : Nucleophilic attack of hydroxide ion



Hydrate anion

Step 2 : Transfer of hydride ion



Hydrate anion

(a) Give a possible explanation why sodium benzoate and methanol are not formed in the crossed Cannizzaro reaction.

(b) Can 2,2-dimethylpropanal $(CH_3)_3$ - C - CHO undergo Cannizzaro reaction? Give a reason for your answer.

5.

An organic compound with the molecular formula $C_9H_{10}O$:

(i) forms the 2,4-DNP derivative.

(ii) does not reduce Tollens' reagent.

(iii) forms iodoform when reacted with sodium hypoiodite.

(iv) gives 1,2-benzenedicarboxylic acid on oxidation.

Determine the compound's structure and illustrate how you utilized provided information to identify it.

6. Although phenoxide ion has a greater number of resonating structure than carboxylate ion, carboxylic acid is a stronger acid than phenol. Why?

7. An organic compound A($C_6H_{12}O_2$) on treatment with $LiAlH_4$ gives B and compound C. The compound B on oxidation gave D which on treatment with aq alkali and subsequent heating furnished E . The latter on catalytic hydrogenation gave C. The compound D was oxidized further to give F which was found to be a monobasic acid (mol formula weight=60) .Identify A,B,C,D and E.

8. An organic compound A on treatment with ethyl alcohol gives a carboxylic acid B and a compound C. Hydrolysis of C under acidic conditions gives B and D. Oxidation of D with $KMnO_4$ also gives B. B upon heating with $Ca(OH)_2$ gives E (mol formulaC_3H_6O),E does not give tollens test and does not reduce Fehling solution but forms a 2,4-dinitrophenyl hydrazone. Identify A,B,C,D and E

AMINES

1.Why are amines less acidic than comparable alcohols?

2.Why are primary amines higher boiling point than tertiary amines?

3.Explain why the amino group in aniline act as powerful activator and ortho and para director towards electrophilic substitution reaction.

4.Condensation of aniline and benzaldehyde gives compound A that is hydrogenated to give B. Identify A and B.

5.An organic compound A having molecular formula $C_2H_5O_2N$ reacts with HNO_2 and gives $C_2H_4O_3N_2$.On reduction A gives a compound C with molecular formula C_2H_7N .C on treatment with HNO_2 gives D which gives iodoform test. Identify A.

6.Give one chemical test to distinguish between the following pairs of compounds

a) Methyl amine and ethyl amine

b) Secondary and tertiary amines

c) Ethyl amine and aniline

7.An organic compound A on treatment with aqueous ammonia and heating forms compound B which on heating with Br_2 and KOH forms a compound C of molecular Formula C6H7N.Write the structure and IUPAC names of compounds A,B and C.

8. Give reason for the following:

a) PKb of aniline is more than that of methyl amine.
b) Aniline get colored on standing in air for a long time.
c) Aromatic amines cannot be prepared by Gabriel Phthalimide synthesis.
d) Can tertiary amines undergo acylation reaction? Explain.

9.How can tri substitution of bromine be prevented?

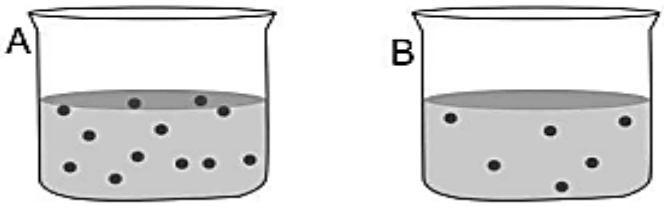
10.Explain why :

a)Ethyl amine is soluble in water.

B)Diazonium salts of aromatic amines are more stable than that of aliphatic amines.

11.

Two beakers 'A' and 'B' contain aqueous solutions of methyl amine. It i observed that beaker A contains more OH^- than beaker 'B'



Prove which of the two solutions will have higher pK_b value and why?

12.

Which out of $H\text{-}NH_2$ and $CH_3\text{-}NH_2$ has higher pKb value? Illustrate the ionisation of these compounds in aqueous medium and write their K_b expression to justify your answer.

13.

There are 5 reagent bottles containing $NaNO_2$, HCl, Phenol, Aniline and NaOH separately in them. The teacher asked Amit to make an orange dye using suitable chemicals out of the five reagents given.

(a)Write the chemical equations and the conditions for the steps involved in the preparation of the orange dye.

(b) Name the type of reaction of the step in which phenol reacts.

SUBJECT	MATHEMATICS
CLASS	XII
MARKS FOR PROJECT (MARKING SCHEME)	10 Mathematical model. (Presentation of content – 2 marks) Notebook. (Assignment Work : Accuracy -2 marks) Ppt/movie. (Creativity – 2, Originality - 2 , Oral Presentation-2)
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	Handwritten Digital
GROUP/INDIVIDUAL	Individual
LIST OF EXPERIMENTS/TOPICS	List of Activities 1. Explore Geogebra app. Please find attached link to learn the basics of geogebra. https://www.youtube.com/live/wmTtfgTvvDo?feature=share. Create your id in the web browser (Geogebra) and prepare a project on any of the following topics. • Inverse Trigonometric Functions • Continuity and Differentiablity 2. Prepare a mathematical model on any one of the following topics: (1) Role of math in the cure of cancer (2) Role of math in setting up a business and maximizing the profit to the company with minimum investment. (3) Role of mathematics in the automobile industry.

GUIDELINES

The objectives of the project work are to enable learners to:

1. Determine Domains and Ranges: Students should be able to identify the domain and range restrictions of inverse trigonometric functions to ensure they are single valued and well defined.
2. Solving equations involving various trigonometric functions requiring careful manipulation and understanding of trigonometric identities.
3. Solving problems students should be available to apply the concepts of quantity and differentiability to solve problems in calculus including Optimisation curve sketching and related rates problem.
4. Exploring applications: Understanding how quantity and differentiability relate to Real world application such as physics engineering economics and Biology and people student understanding of these concepts.
5. Students should develop problem solving skills through exercise and applications that involve applying the concepts of quantity and differentiated to various situations and scenarios.

The expectations of the project work are:

1. Understanding of concepts
2. Problem solving ability
3. Accuracy.
4. Creativity
5. Critical Thinking

Scope of the project:

1. It helps students explore real world applications or connection of the topics with other disciplines.
2. The project addresses the varied interest of Students and allows creativity, independent thinking and collaborative learning.

Expected Checklist:

1. Originality.
2. Creativity
3. Problem solving.
4. Computational Skills

Mode of presentation/submission of the Project:

1. PowerPoint Presentation or movie.
2. Mathematical model
3. Notebook

Assignment

Prove each of the following:

1. $\cos^{-1}\left(\frac{4}{5}\right)+\tan^{-1}\left(\frac{3}{5}\right)=\tan^{-1}\left(\frac{27}{11}\right)$
2. $\tan^{-1}\frac{1}{5}+\tan^{-1}\frac{1}{7}+\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{8}=\frac{\pi}{4}$
3. Solve: $\tan^{-1}\frac{1-x}{1+x}=\frac{1}{2}\tan^{-1}x$
4. Simplify the following:

   I $\tan^{-1}\left(\frac{cosx}{1+sinx}\right)$

   II $\sin^{-1}(x\sqrt{(1-x)}-\sqrt{x}\sqrt{(1-x^2)})$

5. Prove that $\sin^{-1}\frac{1}{\sqrt{5}}+\cot^{-1}3=\frac{\pi}{4}$
6. Simplify the following:

   $\cos^{-1}(3/5\cos x+4/5\sin x)$

   $\tan^{-1}\left(\frac{acosx-bsinx}{bcosx+asinx}\right)$

7. Find the value of $\tan^{-1}(1)+\cos^{-1}(-1/2)+\sin^{-1}(-1/2)$
8. Evaluate : $\tan^{-1}\sqrt{3}-\sec^{-1}(-2)$.
9. Find the value : $\cos^{-1}(\cos 13\pi/6)$

10. Write the function in the simplest form: $\tan^{-1}\left(\frac{cosx-sinx}{cosx+sinx}\right)$
11. Find the value of $\cot^{-1}\frac{ab+1}{a-b}+\cot^{-1}\frac{bc+1}{b-c}+\cot^{-1}\frac{ac+1}{c-a}$
12. If $(\tan^{-1} x)^2 + (\cot^{-1} x)^2 = 5\pi^2/8$, then find x.
13. Solve for x: $\sin^{-1} x + \sin^{-1} 2x = \frac{\pi}{3}$.
14. Find the greatest and the least values of $((\sin^{-1} x)^2 + (\cos^{-1} x)^2$

CONTINUITY AND DIFFERENTIABILITY

Q.1

$$\text{Let } f(x) = \begin{cases} 3ax+b & \text{if } x>1 \\ 11 & \text{if } x=1 \\ 5ax-2b & \text{if } x<1 \end{cases}$$

Find the value of 'a' and 'b' so that f(x) is continuous.

Q2. If the function $f(x) = \frac{x\cos x + \sin x}{x}$; $x \neq 0$

$= k$; $x = 0$

is continuous at x = 0, find 'k'.

Q3. Find the values of a and b such that the function defined by

$$F(x)=\begin{cases} 5, if x \le 2 \\ ax+b, if\ 2<x<10 \\ 21, if x \ge 10 \end{cases}$$

is a continuous function.

Q4. Show that the function f is continuous at x = 0 for all values of a, where

$$F(x)=\begin{cases} x^2, if x \ge 0 \\ ax, if x < 0 \end{cases}$$

Find the right and left hand derivatives at x = 0. Hence, find the value of a for which f is derivable at x = 0.

Q5. If x=asin2t(1+cos2t) and y=bcos2t(1-cos2t) ,show that $(dy/dx)_{\pi/4} = b/a$

Q6. Find the derivative of the following functions w.r.t x :

a. $\left(x^x\right)^x$ b. $(x\log x)^{\log\log x}$ c $x^{\sin 2x + \cos 2x}$

Q7. If $\cos^{-1}(y/b) = \log(x/n)^n$, prove that $x^2y_2 + xy_1 + n^2y = 0$

Q8. Find $\frac{dy}{dx}$ If y==$(\cos x)^{\log x} + (\log x)^x$

Q9. If $x = \tan\left(\frac{\log y}{a}\right)$, prove that $(1 + x^2)\, y_2 + (2x - a)\, y_1 = 0$

Q10. If $y = (\sin^{-1}x)^2$ prove that $(1-x^2)y_2 - xy_1 - 2 = 0$

Q11. Show that the function f(x) = | x | + | x – 1 | , x ∈ R, is continuous at x = 0 and x = 1.

Q12) Find $\frac{dy}{dx}$ if:-

(i) xsecy+ycosx+3xy=4

(ii) $y = \tan^{-1}\frac{3x - x^3}{1-3x^2}$

(iii) $y = \frac{e^{2x} + e^{-2x}}{e^{2x} - e^{-2x}}$

(iv) $y = \sqrt{\log\{\sin(x^2 - 1)\}}$

(v) $y = \sin^{-1}\left[\frac{\sqrt{1+x} - \sqrt{1-x}}{2}\right]^3$

(vi) $x\sqrt{1+y} + y\sqrt{1+x} = 0$

(vii) $y=(\cos x)^{\log x} + (\log x)^x$

Q13) Let $f(x) = \frac{\sqrt{4+x}-2}{x}, x \neq 0$. For $f(x)$ to be continuous at x = 0, find f(0).

Q14) Find dy/dx: $\sin^2 y + \cos xy = \pi$.

Q15) Differentiate $\tan^{-1}\left(\frac{3x-x^3}{1-3x^2}\right)$ w.r.t. $\tan^{-1}\left(\frac{x}{\sqrt{1-x^2}}\right)$.

Q16) Determine f(0), so that the function f(x) defined by

$f(x) = \frac{(4^x-1)^3}{\sin\frac{x}{4}\log\left(1+\frac{x^2}{3}\right)}$ becomes continuous at x=0.

Q17) Discuss the continuity of function at $x = \frac{\pi}{2}$.

$$f(x) = \begin{cases} \frac{K\cos x}{\pi-2x} & at\ x \neq \frac{\pi}{2} \\ 4 & at\ x = \pi/2 \end{cases}$$

Q18) If $x = 3\cos\theta - 2\cos^3\theta$ and $y = 3\sin\theta - 2\sin^3\theta$; find $\frac{d^2y}{dx^2}$.

Q19)If $y = (\log x)^x + x^{\log x}$, find dy/dx.

Q20)If $x = a(\theta + \sin\theta)$, and $y = a(1 - \cos\theta)$, find $\frac{d^2y}{dx^2}$ at $\theta = \frac{\pi}{2}$.

SUBJECT	**BIOLOGY**
CLASS	XII
MARKS FOR PROJECT (MARKING SCHEME)	1.Clearly defined Aim 2. Knowledge Content/Research Work 3. Presentation Technique 4. Viva-voce Total 5 Marks
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	HANDWRITTEN
GROUP/INDIVIDUAL	INDIVIDUAL
LIST OF EXPERIMENTS/TOPICS	Examples of investigatory projects in biology for class 12 students: 1. Investigating the effects of various organic and inorganic fertilizers on plant growth and development. 2. Studying the impact of different types of pollutants (such as heavy metals, pesticides, etc.) on the germination and growth of seeds. 3. Analyzing the effectiveness of natural remedies (herbal extracts, essential oils, etc.) in inhibiting the growth of bacteria or fungi. 4. Examining the relationship between soil composition and the diversity of microbial communities present in different soil samples. 5. Investigating the factors affecting the rate of enzyme activity, such as temperature, pH, and substrate concentration. 6. Studying the genetic diversity of a particular plant species using molecular techniques like DNA fingerprinting or PCR. 7. Exploring the effects of electromagnetic radiation (e.g., from mobile phones, Wi-Fi routers) on the growth and development of plants. 8. Investigating the potential antimicrobial properties of plant extracts against common human pathogens. 9. Analyzing the impact of different types of light (e.g., natural sunlight, LED light, fluorescent light) on the growth and development of indoor plants. 10. Studying the physiological responses of plants to environmental stressors, such as drought, salinity, or heavy metal contamination. 11. Studying the effect of different iron supplementation methods on hemoglobin levels and iron stores in individuals with iron deficiency anemia. 12. Analyzing the impact of various dietary supplements (e.g., vitamin B12, folic acid) on red blood cell production and overall hematological health.

	12. Examining the association between blood lipid profiles (e.g., cholesterol levels) and the risk of developing hematological disorders, such as thrombosis or Coronary Heart Disease 13. Studying the correlation between blood glucose levels and hematological parameters in diabetic patients. 14. Analyzing the hematological changes associated with chronic diseases, such as kidney disease, liver disease, or autoimmune disorders. 15. Studying the relationship between blood type (ABO and Rh) and susceptibility to certain hematological disorders or diseases. 16. Analyzing the hematological effects of environmental factors, such as air pollution or exposure to heavy metals, in urban populations. • Any other topic

GUIDELINES

The objectives of the project work are to enable learners to:

- probe deeper into theoretical concepts learnt in classes XI and XII
- analyse and evaluate real-world biological issues using theoretical constructs and arguments
- demonstrate the application of theoretical concepts in real world problems
- promote scientific method of problem solving.
- develop the communication skills to argue logically

The expectations of the project work are that:

- learners will complete only ONE project in each academic session
- project should be of 2,500-3,000 words (excluding diagrams & graphs), preferably hand-written
- it will be an independent, self-directed piece of study

Scope of the project:

- Project covers various topics in biology such as biotechnology, human diseases, ecology, plant physiology, genetics in integration with other subjects like chemistry and mathematics.
- It also involves formulation of hypothesis and designing experiments to check its validation.

Key guidelines to follow while documenting the investigatory project

1.Index: Maintain index, and neatly organized content with page numbers

2. Title Selection Choose a concise and descriptive title that reflects the purpose of your investigation.

3.Introduction: Provide a clear introduction to the topic, including the background information, significance of the study, and objectives of the project.

4. Review of Literature: Include a brief review of relevant literature and studies related to your topic to show understanding of existing knowledge.

5. Hypothesis- State a clear hypothesis or research question that you aim to investigate through your project.

6. Materials and Methods: Describe the materials (equipment, chemicals, biological specimens) and methods used in your experiment. Include detailed procedures in a step wise manner supported by pictures at each critical step

7. Data Collection and Analysis- Record all data obtained during the experiment systematically. Use appropriate tables, graphs, and charts to present your findings.

8. Results Present the results of your experiment objectively, including any statistical analyses performed. 9 Discussion - Interpret your results and discuss their implications. Compare your findings with existing literature and address any limitations or challenges encountered during the project.

10.Conclusion- Summarize the key findings of your investigation and how they relate to your hypothesis or research question. Give suggestions for further studies that can investigate other aspects not covered by this project

11.Bibliography: Cite all sources of information used in your project, including books, journals, and websites links

12. Acknowledge any individuals or institutions that provided assistance or resources for your project.

It's important to conduct your investigation ethically and ensure that your project is well-documented and scientifically sound.

Expected Checklist:

- Introduction of topic/title
- Identifying the causes, consequences and/or remedies
- Various stakeholders and effect on each of them
- Advantages and disadvantages of situations or issues identified
- Short-term and long-term implications of strategies suggested in the course of research
- Validity, reliability, appropriateness and relevance of data used for research work and for presentation in the project file
- Presentation and writing that is succinct and coherent in project file
- Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.

Mode of presentation/submission of the Project:

At the end of the stipulated term, each learner will present the research work in the Project File to the External and Internal examiner who will judge the project work on parameters given above.

Complete the given assignment:

Organisms and populations

1. Mention any two significant roles predation play in nature?
2. What do you understand by resource partitioning?
3. When and why do some animals like frog hibernate?
4. List the adaptive features evolved in parasites enabling them to live successfully on their hosts?
5. If 8 individuals in a lab population of 80 fruitflies died in aweek, then what would be the death rate of poullation for the said period?
6. In a pond there were 200 frogs. 40 more were born in a year. Calculate the birth rate of the population?
7. How do fishes and snails avoid summer realted unfavorable conditions?
8. Why green plants are not found beyond a certain depth in the ocean?
9. Pollinating species opf wasps show mutualism with a specific fig plant. Mention the benefits the female wasps derive from the fig trees from such an interaction?
10. How is diapauses different form hibernation?
11. Define phenotypic adapation?
12. What does S shaped pattern of population growth represent? How is J shaped pattern different from it and why?
13. Differentiate between hibernation and aestivation with an example.
14. What is aerenchyma? Mention any two specific functions of this tissue in hydrophytes.
15. Name the two basic types of competition found amongst organisms. Which one oof them is more intense and why?
16. Differentiate between mutualism and commensalism.
17. Lichen is considered a good example of obligate mutualism. Explain.
18. List the attributes that population but not the individuals possess.
19. Describe altitude sickness.
20. How sea animals are adapted to excessive cold conditions?
21. Mention the two types of adaptations found in animals of arid areas?
22. Define Allen's rule.
23. Define population density and give the important factors influencing population density? List three ways of measuring population density of a habitat.

    Mention the essential information that can be obtained by studying the population density of an organism.
24. Describe the behavioural dapations in desert lizards.
25. Biomass is more meaningful measure of population size. Explain with an example.
26. Mantion the various factors on which population size keep changing?
27. Why logistic model is considered more realistic?
28. Name the most common defence mechanism shown by plants.give two examples of plants showing this.
29. Mantion the various types of age pyramids and dscribe the bell shaped age pyramid.
30. State Gausse's competitive exclusion principle.
31. Depending upon the effects of light on germination of seed describe the types of seed.

32. Differentiate between eurythermal and stenothermal. Which species out of the two is more likely to survive increased global temperatures and why?
33. What is thermal stratification? How does thermal stratification in temperate lakes help in rich grpwth of phytoplankton during autumn and spring turnover?
34. Name the interaction in each of the folloing cases:
    i) Cuscuta growing on a shoe flower plant.
    ii) Mycorrhizae living on the roots of higher plants.
    iii) Clown fishes living among the tentacles of sea anemone.
    iv) Koel laying her eggs in crow's nest.
    v) Orchid's growing on a mango tree.
    vi) Ticks living on the skin of dogs
    vii) Sea anemone found on the shell of hermit crab
    viii) Ascaris living in the human intestine.
    ix) Sucker fish attached to shark.
    x) Smaller barnacles disappeared when Blanus dominated in the coast of Scotland.
    xi) Eggrets seen with grazing cattle.
35. What is 'r' in the population equation given below: dN/dT=rN.
    How does increase and decrase in the value of 'r' affect the population size?
36. Explain brood parasitism with the help of an example.
37. How does floral pattern of Mediterranean orchid guarantee cross pollination?
38. Discus the different types of migration giving examples.
39. Difeerentiate between i) ectoparasites and endoparasites ii) camouflage and mimicry iii) natality and mortality
40. How do organisms like fungi, zooplanktons and bears overcome the temporary short lived climatic stressful conditions? Explain.
41. Write the features of both plants and animals which helps them to suriveive in water scarce conditions.
42. I) write down the verhulst Pearl logistic growth equation.
    ii) draw a graph for a population whose population density has reached the carrying capacity.
    iii) draw a growth curve where resources are not limiting to growth of a population.

Ecosystem

1. What does secondary productivity in an ecosystem indicate? List any two factor by which productivity is limited in aquatic ecosystem?
2. What is primary productivity? How is it different from net primary productivity?
3. What is gross primary productivity? How it is expressed?
4. Due to uncontrolled excessive hunting the population of tigers in a forest becomes zero. Discuss the long term effects of this situation on the population of deer in that forest.
5. List the parameters used for constructing ecological pyramids. Describe any one instance where the pyramid may look inverted.

6. Why is the length of a food chain in an ecosystem genrally limited to 3-4 trophic levels.
7. In ecosystem the movement of nutrients is called cycling while the term ‘flows’ used for enrgy. Why?
8. Whata re decomposers? What is their function in ecosystem?
9. What is detritus food chain?
10. What is grazing food chain? Give an example from terrestrial and aquatic ecosystem.
11. Name the kind of organisms which constitute the pioneer community of xerarxh and hydrarch successions respectively.
12. Mention the various seral stages of xerosere.
13. What do you understand by pyramid of energy? Why energy decreases from producers to the higher trophic levels.
14. Differentiate between gaseous and sedimentary nutrient cycling.
15. What would happen to successive trophic levels in the pyramid of energy if the rate of reproduction of phytoplanktons was slowed down? Suggest two factors which could cause such a reduction in phytoplankton reproduction.
16. The temperate regions show a lower value of primary productivity as compared to tropical regions? Give resons.
17. Name the type of food chains responsible for the flow of larger fraction of energy in an aaquatic and a terrestrial ecosystem respectively. Mention the differences between the food chains.
18. What si meant by ecological succession? Differentiate between i) pioneer community and climax community ii) seral stages and climax community during succession.
19. What is succession on a bare rock called? Name the first and last but one succession stages in it. Explain how the climax community gets established in this succession?
20. Explain how does succession differs in terrestrial and and aquatic systems?
21. Explain the relationship between incident radiant energy and the energy captured by producers during photosynthesis.
22. Describe pond as an ecosystem.
23. Explain why succession will be faster in a forest devastated by fire than on a bare rock? Compare succession in case of an abandoned land after floods with that on a bare rock.
24. Name the pioneer species on a bare rock. How do they help in establishing the next type of vegetation?

    Mention the type of climax community that will ultimately get established.
25. Construct a pyramid of biomass starting with phytopanktons. Label 3 trophic levels. Is the pyramid upright or inverted? Why?
26. Construct an ideal pyramid of energy when 1000,000J of sunlight is available. Label all its trophic level.
27. Describe the process of decomposition of detritus under the following heads: fragmentation leaching, catabolism, humification and mineralization.
28. Decrsibe dow do oxygen and chemical composition of detritus control decomposition?explain the carbon cycle with the help of simplified model.

29. Draw a pyramid of numbers situation where a large population of insects feed upon a very big tree. The insects in turn are eaten by small birds which in turn re fed upon by big birds.
30. Describe the phosphorus cycle operating in nature.

Biodiversity and conservation

1. Name the various lavels of biodiversity. Which one is the absis of speciation.
2. Who gave the concept of hotspots? What are the major criteria for number of species conserved there?
3. What does the term genetic diversity refers to? What is the significance of large genetic diversity in a population?
4. What is cryopreservation? Give its use.
5. What is biodiversity? Why is it a matter of concern now? Describe the factors responsible for the loss of biodiversity. Mention the significance of the conservation of biodiversity.
6. What is IUCN red list? Give uses of this list.
7. Sometimes introduction of an exotic species upsets native species of the ecosystem. Substantiate the above statement with examples from India.
8. Explain what are ecosystem services? Describe any two of them.
9. Describe the latitudinal gradients of biodiversity?
10. Describe the two measures of species diversity.
11. Biodiversity decreases as one moves from equator towards the poles. Substantiate the statement with example.
12. Explain coextinctions with an example.
13. List the features that make a stable biological community.
14. In the biosphere immense biological diversity exists at all levels of biological organization. Explain any two levels of biodiversity.
15. Justify with the help of an example where a deliberate attempt by humans has led to the extinction of a particular species.
16. Differentiate between ex situ and in situ approaches of conserving biodiversity.
17. Give three reasons why the prokaryotes are not given any figures for their diversity by the ecologist?
18. What are biosphere reserves? Mention the importance of setting biosphere reserves?
19. Describe seed banks.
20. Amazonian rain forest has the greatest biodiversity on earth. List any two hypothesis that are proposed by biologists to account for the the greater biological diversity.
21. What are the two types of desirable approaches to conserve biodiversity? Explain with examples bringing out the differences between the two types.

SUBJECT	COMPUTER SC.
MARKS FOR PROJECT (MARKING SCHEME)	PROJECT REPORT:- 7 MARKS VIVA :- 3 MARKS
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	TYPED
GROUP/INDIVIDUAL	GROUP OR INDIVIDUAL
LIST OF EXPERIMENTS/TOPICS	Examples of investigatory projects in computer sc. for class 12 students 1) Out of School Children 2) Pet Shop 3) Fashion Stores 4) Blood Bank 5) Prisoner Database record keeping system 6) HLA type 7) Car Stock Management 8) URBAN OASIS RESORT EXPENSE 9) Farm Management System 10) Cafeteria Management System Any other project topic of student's choice

GUIDELINES

The objectives of the project work are to enable learners to:

- Gain hands-on experience with Python file handling and Python-SQL connectivity.
- Identify and solve real-world problems using programming skills.
- Collaborate effectively in groups to develop tangible and useful applications.
- Explore creative solutions to address the needs of local businesses or communities.
- Develop skills in self-directed learning and problem-solving.
- Understand the importance of avoiding plagiarism and respecting copyright issues in their work.

The expectations of the project work are that:

- Students work in groups of two to three, starting at least six months before the submission deadline.
- Projects address real-world problems identified through interactions with local businesses or communities.
- Projects demonstrate proficiency in Python file handling and Python-SQL connectivity.
- Creativity and innovation are encouraged in project development.
- Additional learning may be required for certain project ideas, which is encouraged.
- Teachers take measures to ensure students understand and avoid plagiarism and copyright violations

Scope of the project:

- Projects involve creating tangible and useful applications using Python.
- Applications may include but are not limited to:
    - Handling raw data and generating invoices for businesses.
    - Developing user-friendly software for various purposes such as games, school utilities, or applications for disabled students.
- Use of Python libraries is encouraged to enhance application functionality.
- Projects should address real-world problems and provide practical solutions.
- Emphasis on creativity and innovation in project development

Key guidelines to follow while documenting the investigatory project

1) **INDEX :**Maintain index, and neatly organized content with page numbers
2) **Title Selection :-** Choose a concise and descriptive title that reflects the purpose of your investigation.
3) **Certificate and Acknowledgment**
4) **Introduction:** Provide a clear introduction to the topic, including the background information, significance of the study, and objectives of the project.
5) **Files and Functions created**: Describe the name of py file and functions inside each file
6) **Code:-** Take screenshot/ copypaste of code
7) **Output:-** Take screenshot of the output of each option.
8) **Future Scope:-** Write the future scope of the project.
9) **Bibliography :** Cite all sources of information used in your project, including books and websites links

Expected Checklist:

- Form groups of two to three students.
- Start working on the project at least six months before the submission deadline.
- Identify a real-world problem to solve through interactions with local businesses or communities.
- Utilize Python file handling and Python-SQL connectivity in project development.
- Develop a tangible and useful application addressing the identified problem.
- Use Python libraries as needed to enhance application functionality.
- Ensure the project demonstrates creativity and innovation.
- Adhere to ethical standards, including avoiding plagiarism and respecting copyright issues.
- Teachers provide guidance and support throughout the project development process

Mode of presentation/submission of the Project:

At the end of the stipulated term, each learner will present the research work in the **Printed** Project File to the External and Internal examiner. The questions should be asked from the Research Work/ Project File of the learner. The Internal Examiner should ensure that the study submitted by the learner is his/her own original work. In case of any doubt, authenticity should be checked and verified.

ASSIGNMENT

RELATIONAL DATABASES- APPLICATION BASED QUESTIONS

1) Given the following table named Furniture

Fur_Id	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	Red rose	Double Bed	23-Feb-2006	32000	15
2	Soft touch	Baby cot	20-Jan-2006	9000	10
3	Jerry's home	Baby cot	19-Feb-2006	8500	10
4	Rough woof	Office table	01-Jan-2006	20000	20
5	Comfort zone	Double Bed	12-Jan-2006	15000	20
6	Jerry look	Baby cot	24-Feb-2006	7000	19
7	Lion king	Office table	20-Feb-2006	16000	20
8	Royal tiger	Sofa	22-Feb-2006	30000	25
9	Park sitting	Sofa	13-Dec-2005	9000	15
10	Dine Paradise	Dining Table	19-Feb-2006	11000	15

a. Write the name of attributes of table furniture

b. Write the degree and cardinality of the table furniture

c. Categorize the following commands into DDL and DML

Insert, select , create, update, alter, drop and delete

d. Identify the Primary Key in the above table

e. Identify the candidate keys and Alternate keys.

f. Anuj has added two records in the table and wants to make permanent changes in the database. Write the command and its category.

g. Ram has updated the price by 10% of office table in the table and wants to undo changes made in the database. Write the command and its category

h. Identify which of the following records can be inserted successfully in the furniture table and give reasons also

- (Tom look, Baby cot, 24-Feb-2007, NULL, NULL)
- (NULL, Baby cot, 24-Feb-2007, NULL, 10)
- (Tom look, Baby cot, 24-Feb-2007, 15000, 10)

i. Can a user assign duplicate values in the attribute Fur_ID?

2) Study the following tables Guest and Room & answer the questions given below:

Table : Guest

Guest_No	Name	Room_no	Dt_Checkin	Dt_Chec
1012	R.K. Misra	101	03/24/2006	03/25/20
1034	P. Suresh	104	03/04/1995	03/07/19
2034	R. Jamal	104	05/16/1996	05/22/19
2392	V. Ashwin	103	04/06/2000	04/08/20

Table : Room

Room_no	Type	Tariff
101	Single AC	1200
102	Single Deluxe	1600
103	Double Deluxe	2300
104	Deluxe Suite	3200

(i) Suggest data types that should be used for each of the fields in the table guest.

(ii) Name the field which can act as the foreign key for the table guest.

(iii) What type of relationship exists between the table Guest and the table Room?

3) Given the following tables

Table: WEB SITES

SITE_ID	SITE_CAT	SITE_LAUNCH	SITE_VOTES
S100	Commerce	11/11/2005	2S000
S101	Government	10/06/2007	15000
S102	Education	07/02/2008	45000
S103	Organisation	11/10/2008	42000

1. Name the field which can act as the Primary Key in the table Websites
2. Suggest the data types that should be used for each of the fields in the table websites.

SIMPLE QUERIES IN SQL

4) Write the difference between the following
   a. Char and varchar data type
   b. Use command and desc command

5) Write a short note on the following
   a. distinct clause
   b. Like operator and the wild card characters used in it.
   c. Order by clause

6) Write SQL commands for the Graduate table

on the basis of given table GRADUATE :

Table : GRADUATE

S.NO.	NAME	STIPEND	SUBJECT	AVERGE	Rank
1	KARAN	400	PHYSICS	68	1
2	DIVAKAR	450	COMPUTER SC	68	1
3	DIVYA	300	CHEMISTRY	62	2
4	ARUN	350	PHYSICS	63	1
5	SABINA	500	MATHEMATICS	70	1
6	JOHN	400	CHEMISTRY	55	2
7	ROBERT	250	PHYSICS	64	1
8	RUBINA	450	MATHEMATICS	68	1
9	VIKAS	500	COMPUTER SC	62	1
10.	MOHAN	300	MATHEMATICS	57	2

1) Create the database with your name
2) Open the database
3) Create the graduate table with appropriate constraints
4) Insert 5 rows
5) Display all the records
6) Display the names of students whose subject is mathematics
7) Display the names of students whose subject is mathematics and rank is 1
8) Increase the stipend by 10% of those students whose rank is 1
9) Delete the records of those students whose average is < 60
10) Display the name and subject of rank 2 holders
11) Change the subject from computer science to physical education if rank is 1
12) Display the name of those students who have scored greater than 60percent in chemistry.
13) Display the details of those students who have subject chemistry or physics
14) Display the details of those students who have subject chemistry or physics or computer sc.
15) To display different types of subject from table graduate.

Like operator

Name should start with E - name like "E%"

Name should end with E - name like "%E" Third char of name should be E- name like "_E%" Second last char of name should be A- name like "%A_" Name should be of 4 characters name like " "

16) Display the details of those students whose name is starting with letter.
Display the details of those students whose name is ending with letter R
17) Display the details of those students whose third letter of name is R
18) Display the name of those students who did not get any stipend.
19) Insert a New row in table graduate
20) WAQ to change the subject of student named Vikas to Physics.
21) WAQ to increase the stipend by 10% for all students.
22) WAQ to increase the stipend by 5% for computer sc students
23) WAQ to give stipend as 500 and avg marks as 80 to physics students
24) Add a new column named remarks with 20 characters
25) Increase the width of column name to 30 characters
26) Change the column name from average to avg
27) Remove the primary key constraint from the table
28) Create a new table named mygrad that will contain all columns but tuples of rank 1 students only.
29) Create a new table named mygrad_col that will contain all rows but name, subject and average columns
30) Create a new table named mygrad_all that will contain all the rows and columns of graduate table.
31) Delete all the rows
32) Delete all the records of physics students

22) Write SQL Queries for the following table

FACULTY

F_ID	Fname	Lname	Hire_date	Salary
102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Soni	18-5-2001	14000
105	Rashmi	Malhotra	11-9-2004	11000
106	Sulekha	Srivastava	5-6-2006	10000

COURSES

C_ID	F_ID	Cname	Fees
C21	102	Grid Computing	40000
C22	106	System Design	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Network	20000
C26	105	Visual Basic	6000

(i) To display the course id , course name and fees of those courses which are taught by faculty ‘Sulekha’.
(ii) Display the faculty id, firstname, lastname, course name and fees
(iii) Display the faculty id, firstname, lastname, course name and fees of the courses starting with C.

(iv) Display the faculty id, firstname, lastname, course name and fees of the faculties joined in 2004.
(v) Identify the Primary Key and Foreign key from course table.
(vi) Find the degree and cardinality of faculty and courses table.
(vii) Find the max, minimum, average salary, total salary
(viii) Count the number of courses.
(ix) Find the output
a. SELECT MIN(HIRE_DATE) FROM FACULTY;
b. Select fname, lname, salary from faculty where lname like "%a";

Q3. Queries based on group by and joins

TABLE: SENDER			
SenderID	**SenderName**	**SenderAddress**	**SenderCity**
ND01	R Jain	2, ABC Appts	New Delhi
MU02	H Sinha	12, Newtown	Mumbai
MU15	S Jha	27/A, Park Street	Mumbai
ND50	T Prasad	122-K, SDA	New Delhi

TABLE: RECIPIENT				
RecID	**SenderID**	**RecName**	**RecAddress**	**RecCity**
KO05	ND01	R Bajpayee	5, Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A Vihar	New Delhi
MU19	ND01	H Singh	2A, Andheri East	Mumbai
MU32	MU15	P K Swamy	B5, C S Terminus	Mumbai
ND48	ND50	S Tripathi	13, B1 D, Mayur Vihar	New Delhi

SECTION A

a) To display number of Recipients from each City. Also write the output
b) To display number of Recipients from each City whose recipient are more than 1. Also write the output.
c) To display the RecID, SenderName, SenderAddress, RecName, RecAddress for every Recipient.
d) To display the names of all the senders from Mumbai.
e) To display Recipient details in ascending order of RecName.
f) Insert a new record in Sender table.
g) Add a new column named Pincode in the table Recipient.

h) Change the city of Sender T Prasad to Kolkatta.

i) Find the output

a. Select distinct RecCity from recipient;

b. Select count(distinct reccity) from recipient;

c. Select count(*) from recipient where recname like "S%";

Q3. Queries based on group by

TRAINER

TID	TNAME	CITY	HIREDATE	SALARY
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARG	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

a) Display the sum of salary city wise. Also display the output

b) Display the average salary city wise for cities Delhi and Mumbai. Also display the output

c) Display the Trainer Name, City & salary in descending order of their Hiredate.

d) To display the TNAME and CITY of Trainer who joined the Institute in the month of December 2001.

e) To display number of Trainers from each city.

Q4. . Queries based on joins and group by:

TRAINER

TID	TNAME	CITY	HIREDATE	SALARY
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARG	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	AGDCA	12000	2018-07-02	101
C202	ADCA	15000	2018-07-15	103
C203	DCA	10000	2018-10-01	102
C204	DDTP	9000	2018-09-15	104
C205	DHN	20000	2018-08-01	101
C206	O LEVEL	18000	2018-07-25	105

f) To display TNAME, HIREDATE, CNAME, STARTDATE from tables TRAINER and COURSE of all those courses whose FEES is less than or equal to 10000.

g) To display number of Trainers from each city.

SUBJECT	ECONOMICS
MARKS FOR PROJECT (MARKING SCHEME)	1. Relevance of the topic 3 marks 2. Knowledge Content/Research Work 6 marks 3. Presentation Technique 3 marks 4. Viva-voce 8 marks Total 20 Marks
MODE OF SUBMISSION (TYPED/HANDWRITTEN)	HANDWRITTEN
GROUP/INDIVIDUAL	INDIVIDUAL
LIST OF EXPERIMENTS/TOPICS	• Micro and Small Scale Industries • Food Supply Channel in India • Contemporary Employment situation in India • Disinvestment policy of the government • Goods and Services Tax Act and its Impact on GDP • Health Expenditure (of any state) • Human Development Index • Inclusive Growth Strategy • Self-help group • Trends in Credit availability in India • Monetary Policy Committee and its functions • Role of RBI in Control of Credit • Government Budget & its Components • Trends in budgetary condition of India • Exchange Rate determination – Methods and Techniques • Currency War – reasons and repercussions • Livestock – Backbone of Rural India • Alternate fuel – types and importance • Sarva Shiksha Abhiyan – Cost Ratio Benefits • Golden Quadrilateral- Cost ratio benefit • Minimum Support Prices • Relation between Stock Price Index and Economic Health of a Nation • Waste Management in India – Need of the hour • Minimum Wage Rate – Approach and Application • Digital India- Step towards the future • Rain Water Harvesting – A solution to water crisis • Vertical Farming – An alternate way • Silk Route- Revival of the past

	• Make in India – The way ahead • Bumper Production- Boon or Bane for the farmer • Rise of Concrete Jungle- Trend Analysis • Organic Farming – Back to the Nature • Aatmanirbhar Bharat • e-Rupee (e- ₹) • Sri Lanka's Economic Crisis • Sustainable Development Goals (SDG's) • Environmental Crisis • Comparative Study of Economies (Maximum three economies) • New Education Policy (NEP) 2020: A Promise for a New Education System • G-20: Inclusive and Action Oriented • Amrit Kaal: Empowered and Inclusive Economy • Cashless Economy • Any other newspaper article and its evaluation on basis of economic principles • Any other topic

GUIDELINES

The objectives of the project work are to enable learners to:

• probe deeper into theoretical concepts learnt in classes XI and XII

• analyse and evaluate real-world economic scenarios using theoretical constructs and arguments

• demonstrate the learning of economic theory

• follow up aspects of economics in which learners have interest

• develop the communication skills to argue logically

The expectations of the project work are that:

• learners will complete only ONE project in each academic session

• project should be of 3,500-4,000 words (excluding diagrams & graphs), preferably hand-written

• it will be an independent, self-directed piece of study

Scope of the project:

Learners may work upon the following lines as a suggested flow chart:

- Choose a title/topic
- Collection of the research material/data
- Organization of material/data
- Present material/data
- Analysing the material/data for conclusion
- Draw the relevant conclusion
- Presentation of the Project Work

Expected Checklist:

• Introduction of topic/title

• Identifying the causes, consequences and/or remedies
• Various stakeholders and effect on each of them
• Advantages and disadvantages of situations or issues identified
• Short-term and long-term implications of economic strategies suggested in the course of research
• Validity, reliability, appropriateness and relevance of data used for research work and for presentation in the project file
• Presentation and writing that is succinct and coherent in project file
• Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.

Mode of presentation/submission of the Project:

At the end of the stipulated term, each learner will present the research work in the Project File
to the External and Internal examiner. The questions should be asked from the Research Work/ Project File of the learner. The Internal Examiner should ensure that the study submitted by the learner is his/her own original work. In case of any doubt, authenticity should be checked and verified.

ASSIGNMENT

SECTION A

1. Which of the following is a stock variable?
a) Interest on capital c) expenditure of money
b) Distance between Goa and Hyderabad d) All of the these.
2. What items are not included in M1 measure of money supply?
a) Currency and coins with public c)Other deposits with RBI
b) Inter-bank deposits d) Net demand deposits with banks.
3. What is Repo rate ?
4. Break-even point is achieved when
a)National income = consumption b) consumption=investment
c)Consumption= saving d) national income>consumption
5. Which of the following can have a negative value?
a) APC b) MPC c) MPS d) APS
a) Invisible trade c) one-sided transaction
b) Visible trade d) unrequited remittances
6. When actual aggregate demand exceeds the aggregate demand required for full employment what will you call that situation?
7. Escheats is an example of :
a) Capital receipt c) revenue receipt
b) Capital expenditure d) revenue expenditure
8. Export and import of goods is also known as: _____
9. Distinguish between intermediate goods and final goods.

10. Define investment multiplier. Explain the relationship between Marginal propensity to consume and multiplier.

11. Explain how the commercial bank creates credit money?

12. How are the following used to correct excess demand and deficient demand?

a) Bank rate (3x2)

b) Open market operations

c) Government expenditure

13. Explain the equilibrium level of income and employment with the help of savings and investment curves.

SECTION B

14. When was the planning commission established?

a) 1947 b) 1948 c) 1950 d) 1951

15. Public sector enterprises are driven largely by consideration of :

a) Profit b) social welfare c) either (a) or (b) d) none of these

16. Which type of unemployment is found in the agricultural sector?

a) Disguised unemployment c) structural unemployment

b) Industrial unemployment d) educated unemployment

17. Under which infrastructure transport, banking and irrigation fall?

18.The number of people who are able to work and willing to work at

19. What measures have been taken under Liberalisation (any four)

20.What is privatization and explain steps taken toward it ?

21. Explain any four sources of human capital formation.

22. What is green revolution? How does it benefit to farmers?

23. Explain ‘growth, equity and self–reliance‘ as long-term economic Planning.

SUBJECT	PSYCHOLOGY
TOPIC	What is Psychology?
PROJECT/ACTIVITY	Activity 1: Photo Essay: students to collect a series of photographs that depict moments, scenes, or objects that symbolize values and human qualities such as resilience, optimism, compassion, perseverance, gratitude, kindness, empathy, and strength. These photos can be taken by the students themselves or sourced from various online platforms, ensuring they are appropriate and properly credited. Caption and Reflection: For each photo, students are required to provide a caption that explains the significance of the image in relation to the chosen value or quality. Additionally, students should include a brief reflection on why they selected the photo and how it personally resonates with them. This reflection can include personal anecdotes, experiences, or insights related to the theme. Activity 2: PPT Prepare a PPT on how the evolving discipline of Psychology is related to other disciplines. You may explore implementation of psychological principles in aviation, defence, economics and political science. The PPT should showcase your interpretation and not have more than 15 slides.
LEARNING OUTCOME/SKILL ENHANCED	• Learning Outcome – Activity 1 • Students will be able to identify and recognize values and human qualities such as resilience, optimism, compassion, perseverance, gratitude, kindness, empathy, and strength. • Understand the significance of these values and qualities in promoting well-being and psychological resilience. • Develop skills in visual storytelling and communication through the creation of a picture essay. • Cultivate self-awareness and reflection by exploring personal connections to the chosen values and qualities. • Enhance empathy and perspective-taking through the consideration of diverse perspectives represented in the photos. • Learning Outcome – Activity 2 • Students will gain an understanding of how the evolving discipline of psychology is interconnected with other fields such as aviation, defense, economics, and political science. • Students will develop understanding of how psychological principles are applied in practical contexts within each discipline.

	• Students will analyze the impact of psychological interventions in various fields and considering the ethical implications of applying psychological principles in different contexts. • Students will become aware of potential career opportunities in interdisciplinary fields where knowledge of psychology can be applied, such as human factors engineering, defense psychology, behavioral economics, and political consulting
MODE OF SUBMISSION	Virtual Submission (through mail)
RUBRICS	Activity 1: • Photo selection and attribution • Reflection caption • Creativity and Presentation Activity 2: • Content- accuracy, depth and relevance • Clarity- organization, structure and language • Visual Design and presentation

ASSIGNMENT

- *Section A has 10 questions, from Question No. 1 to 10. Answer to these questions in one word or one sentence.*
- *Section B has 3 questions, from Question No. 11 to 13. Answer to these questions should not exceed 40-50words.*
- *Section C has 1 question. Answer to this question should not exceed 120 words.*
- *Section D has 1 question. Answer to this question should not exceed 200 words.*

SECTION A (1*10)

Q1.) _____ is the most effective way of acquiring a conditioned response.

Q2.) Partial reinforcement schedule is least resistant to extinction.

Q3.) _____ is one of the chief proponents of operant conditioning.

a.) B.F Skinner
b.) Ivan Pavlov
c.) Tolomon
d.) Albert Bandura

Q4.) Which of the following helps in better memory retention?

a.) Use of mnemonics
b.) Deep level processing
c.) Minimizing interference
d.) All of the above

Q5.) Which of the following does not apply to stage model theory of memory?

a.) It was proposed by Atkinson and Shiffrin
b.) Information in sensory register fades very quickly
c.) Chunking helps in enhancing the capacity of STM.
d.) Many stimuli simultaneously enter our receptors creating a kind of "bottleneck" situation.

Q6.) Method of Loci uses imagery and visual encoding for better memory retention. (True/False)

Q7.) Neema was once mobbed by a person with a beard. Now every time she comes across a bearded person she starts feeling anxious. She is exhibiting:

a.) Generalization
b.) Discrimination
c.) Resistance
d.) Extinction

Q8.) Which of the following is not a secondary reinforcer?

a.) Money
b.) Fame
c.) Certificates
d.) Food

Q9.) Sudden solution to a problem is a principle of _____ learning.

Q10.) Classical conditioning was first investigated by _____.

Section B (2*3)

Q11.) Differentiate between maintenance and elaborative rehearsal.
Q12.) What are the different types of long-term memory?
Q13.) What are the different phases of skill acquisition?

Section C (3*1)

Q14.) Explain observational learning with the help of examples.

Section D (6*1)

Q15.) Explain the various stages of stage model of memory.

Or

Differentiate between classical and operant conditioning.

PROJECT 1

SUBJECT	**PHYSICAL EDUCATION**
ASSESSMENT PARAMETER (MULTIPLE ASSESSMENT/SUBJECT ENRICHMENT)	SUBJECT ENRICHMENT
TOPIC	1. History of the game/sport. (choose anyone Game/Sport) Athletics, Badminton, Chess, Boxing, Tennis, Gymnastic, Rope Skipping, Yoga 2. Draw a neat diagram of court/field of your specialized game 3. Dimension of court/field and equipment's 4. Fundamental skills and Terminology of the game 5. Latest rules and regulation of the game 6. Famous personalities and tournaments related to your specialized game. 7. Write down the list of national award winners (Dronacharya award, Arjun award of your respective game. 8. Fitness Tests: Pushups and Modified pushups, Shuttle run, standing broad jump/ Long jump, 50-meter sprint, 600-meter walk and run test. 9. Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease- Diabetes, Asthma, Hypertension, Back pain, Obesity.
PROJECT/ACTIVITY	PROJECT PRACTIAL FILE
HOLIDAY HOMEWORK GUIDELINES LEARNING OUTCOME/SKILL ENHANCED	1. Students will develop competency in many movement activities. 2. Students will understand *how* and *why* they move in a variety of situations and use this information to enhance their own skills. 3. Students will achieve and maintain a health-enhancing level of physical fitness. 4. Students will exhibit a physically active lifestyle and will understand that physical activity provides opportunities for enjoyment, challenge and self-expression. 5. Students will demonstrate responsible personal behavior while participating in movement activities. 6. Students will demonstrate responsible social behavior while participating in movement

	activities. Students will understand the importance of respect for others. 7. Students will understand the relationship between history, culture and games.
RESOURCES (Online Links)	https://youtu.be/yRzHRKFhAz0?si=bIMbkyjiTU5R2tSq https://youtu.be/LB0f1LkenRQ?si=Ks6tGU6Rqvd7nZS3
MODE OF SUBMISSION	ONLINE /OFFLINE

PROJECT 2

SUBJECT	**PHYSICAL EDUCATION**
ASSESSMENT PARAMETER (MULTIPLE ASSESSMENT/SUBJECT ENRICHMENT)	MULTIPLE ASSESSMENT
TOPIC	INTERNATIONAL YOGA DAY
PROJECT/ACTIVITY	• You have to do any five asanas and clicking the pictures and make a collage and two videos of asanas and share youtube link on given mail id. balwadasushil@gmail.com
HOLIDAY HOMEWORK GUIDELINES LEARNING OUTCOME/SKILL ENHANCED	Develop the habit of practicing yoga asanas and pranayama daily
RESOURCES (Online Links)	https://youtu.be/3KaAG_FME-A?si=uMIBZOJ36T6Vc4Nw https://youtu.be/OcKTF01z-JM?si=wIcXqbXFz13TlU7E
MODE OF SUBMISSION	ONLINE

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