SUMMER VACATION ASSIGNMENT

CLASS XII

PHYSICS

1. Search the topic for physics investigatory project and prepare a layout containing Aim, Theory, Procedure, Graphs/Diagrams etc.
2. Prepare a mind map on A-4 size sheet containing all the relevant formulae of the following chapters
   a) RAY OPTICS
   b) DUAL NATURE OF RADIATION AND MATTER
   c) ATOMS
   d) NUCLEI
3. Complete the given assignments.

ASSIGNMENT NO. 1

TOPIC - RAY OPTICS

SUB-TOPIC – REFLECTION OF LIGHT

1. Light of wavelength 5000Å falls on a plane-reflecting surface. What are the wavelength and frequency of reflected light? For what angle of incidence is the reflected ray normal to the incident ray?
2. When an object is placed at a distance of 60cm from a convex spherical mirror the magnification produced is 1/2. Where the object should be placed to get magnification of 1/3?
3. Why are the mirrors used in searchlights parabolic and not concave spherical?
4. A ray incident along normal to the mirror retraces its path. Why?
5. A square wire of side 3cm is placed 25cm away from a concave mirror of focal length 10cm. What is the area enclosed by the image of the wire? (The Centre of the wire lies on the axis of the mirror, with its two sides normal to the axis.)
6. A concave mirror produce a two times enlarged virtual image of an object placed 15cm away from the mirror. Find the focal length of the mirror and by how much distance the object be displaced and in what direction in order to get two times enlarged real image of the object?

7. Two concave mirrors have the same focal length but the aperture of one is larger than the other .Which mirror forms the sharper image and why?
8. The distances of an object and its real image measured from the focus of a concave mirror are a and b respectively. Show that f^2 =ab
9. Calculate the distance of an object of height h from a concave mirror of radius of curvature 20cm, to obtain a real image of magnification 2. Find the location of image also. Using mirror formula, explain why does a convex mirror always produces a virtual image.
10. With the help of a suitable ray diagram, derive the mirror formula for a concave mirror.

ASSIGNMENT NO. 2

RAY OPTICS

REFRACTION OF LIGHT

1. A ray of light passes from air to glass (n=1.50) at an angle of 30°. Calculate angle of refraction. What is the speed of light in glass?
2. A double convex lens of refractive index 1.56 has both radii of curvature of magnitude 20 cm. If an object is placed at a distance of 10 cm from the lens, find the position of the image formed.
3. A bioconvex lens has a focal length 2/3 times the radius of curvature of either surface. Claculate the refractive index of the lens material.
4. Find the radius of curvature of convex surface of plano convex lens, whose focal length is 0.3 m and n = 1.5
5. A concave lens is placed in contact with a convex lens of focal length 25 cm. The combination produces real image at a distance of 80 cm when object is at 40 cm. What is the focal length of concave lens?
6. What is the ration of the velocities of two light waves travelling in vacuum and having wavelengths 4000 Å and 8000 Å?
7. Two thin lenses of power of 6D and -2D are in contact. What is the focal length of the combination?
8. A glass lens of refractive index 1.45 when immersed in a transparent liquid become invisible. Under what condition does it happen?

9. A diverging lens of focal length F is cut into two equal parts each forming a plano concave lens. What is the focal length of each part?
10. Draw a plot showing the variation of power of a lens with the wavelength of incident light?
11. An equiconvex lens of focal length 15 cm is cut into two equal halves in thickness. What is the focal length of each half?
12. A converging lens of focal length 1.5 is kept in a liquid medium having same refractive index. What would be the focal length of the lens in this medium?
13. How does the power of a lens vary, if a violet light replaces the incident red light?
14. When monochromatic light travels from one medium to another its wavelength changes but frequency remains same. Explain?
15. For the same value of angle of incidence, the angle of refraction in three media, A, B and C are 15°, 25° and 35° respectively. In which medium would the velocity of light be minimum?
16. If the wavelength of the light incident on a convex lens is increased, how will its focal length change?
17. A bioconvex lens made of transparent material of refractive index 1.5 is immersed in water of refractive index 1.65. Will the lens behave as a converging or a diverging lens? Give reason.
18. A bioconvex lens of refractive index 1.5 is immersed in water of refractive index 1.33. Will the lens behave as a converging or a diverging lens? Give reason.

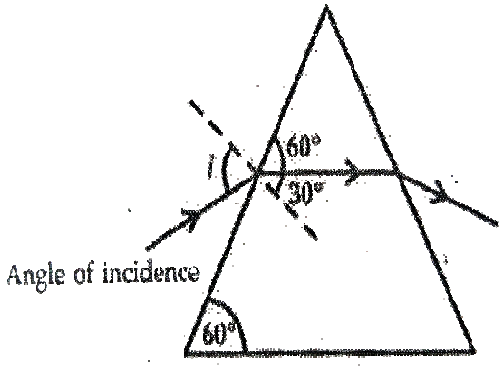
ASSIGNMENT NO. 3

SUBJECT - PHYSICS

RAY OPTICS

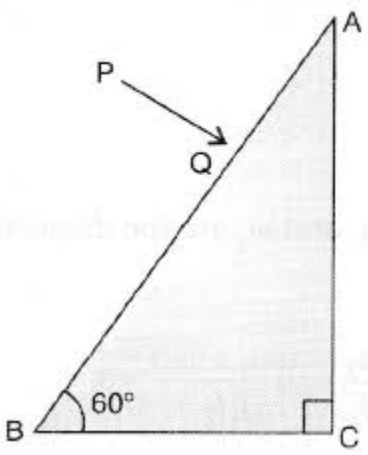
SUB-TOPIC- PRISM AND TIR

1. A thin prism of 6° angle gives a deviation of 3°.What is the refractive index of the material of the prism.
2. The angle of minimum deviation for prism of angle π/3 isπ/6. Calculate the velocity of light when velocity in vacuum is $3*10^8$ m/s.
3. A prism of refractive index 1.53 placed in water of refractive index 1.33. If the angle of prism is 60^0, calculate the angle of minimum deviation in water.
4. A ray of light is incident at an angle of 60° on one face of a 30° prism. The emergent ray from the prism makes an angle of 30° with the incident ray. Show that the emergent ray is normal to the surface from which it emerges. Calculate the refractive index of the material of the prism.
5. How does the angle of minimum deviation of a glass prism vary, if the incident violet light is replaced with red light?
6. A ray of light, incident on an equilateral glass prism (μ_g =√3) moves parallel to the base line of the prism inside it. Find the angle of incidence for this ray.

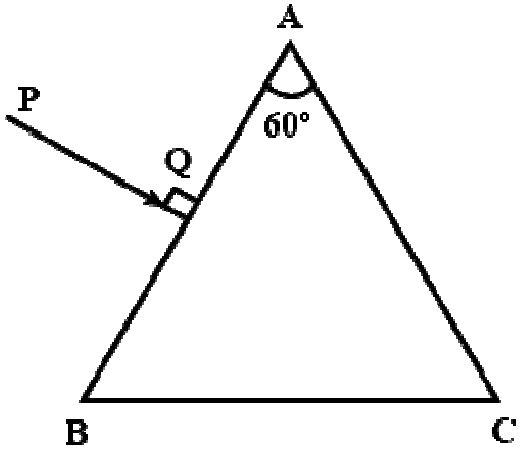


7. A ray PQ incident normally on the refracting face BA is refracted in the prism BAC made of material of refractive index 1.5. Complete the path of

ray through the prism. From which face will the ray emerge? Justify your answer.



8. A ray of light is incident on a glass prism of refractive index and refractive angle A. If it just suffers total internal reflection at the other face, obtain an expression relating the angle of incidence, angle of prism and critical angle.
9. A ray PQ is incident normally on the face AB of a triangular prism of refracting angle of 60°, made of a transparent material of refractive index 2√3 as shown in the figure. Trace the path of the ray as it passes through the prism. Also, calculate the angle of emergence and angle of deviation.



10. The minimum deviation produced by a glass prism of angle 60°is 30°. If the velocity of light in vacuum is $3X10^8 ms^{-1}$, calculate the velocity of light in glass.

11. Calculate the speed of light in a medium whose critical angle is 30°.

12. For which color the refractive index of prism material is maximum and minimum.

13. Out of blue and red light, which is deviated more by a prism? Give reason.

ASSIGNMENT NO. 4

OPTICAL INSTRUMENTS

1. You are given following three lenses. Which two lenses will you see as an eyepiece and as an objective to construct an astronomical telescope?

Lenses	Power	Aperture
L1	3D	8 cm
L2	6D	1 cm
L3	10D	1 cm

2. Why must both the objective and the eyepiece of a compound microscope have short focal lengths?

3. A small telescope has an objective lens of focal length 150 cm and eyepiece of focal length 5 cm. What is the magnifying power of the telescope for viewing distant objects in normal adjustment?
   If this telescope is used to view a 100 m tall tower 3 km away, what is the height of the image of the tower formed by the objective lens?

4. (i) Draw a neat labelled ray diagram of an astronomical telescope in normal adjustment. Explain briefly its working.

(ii) An astronomical telescope uses two lenses of powers 10D and 1D. What is its magnifying power in normal adjustment?

5. A compound microscope uses an objective lens of focal length 4cm and eyepiece lens of focal length 10cm. An object is placed at 6cm from the objective lens. Calculate the magnifying power of the compound microscope. Also, calculate the length of the microscope.

6. (a) A giant refracting telescope at an observatory has an objective lens of focal length 15m. If an eyepiece of focal length 1.0 cm is used, what is the angular magnification of the telescope?

   (b) If this telescope is used to view the moon, what is the diameter of the image of the moon formed by the objective lens? The diameter of the moon is 3.42×10^{6} m, and the radius of lunar orbit is 3.8×10^{8} m.

7. A small telescope has an objective lens of focal length 140cm and an eyepiece of focal length 5.0cm. What is the magnifying power of the telescope for viewing distant objects when

   (a)the telescope is in normal adjustment (i.e., when the final image is at infinity)?

   (b) the final image is formed at the least distance of distinct vision (25cm)?

   Also find the separation between the objective lens and the eye piece.

8. The total magnification produced by a compound microscope is 20. The magnification produced by the eyepiece is 5. The microscope is focussed on a certain object. The distance between the objective and eye-piece is

observed to be 14cm. If the least distance of distinct vision is 20cm, calculate the focal length of the objective and the eye-piece.

9. (a) Draw a ray diagram for the formation of image by a compound microscope.

   (b) You are given the following three lenses. Which two lenses will you use as an eyepiece and as an objective to construct a compound microscope?

Lenses	Power (D)	Aperture (cm)
L_1	3	8
L_2	6	1
L_3	10	1

ASSIGNMENT NO. 1

ATOMS

1. Write the expression for Bohr's radius in hydrogen atom. (1)

2. What is the ratio of radii of the orbits corresponding to first excited state and ground state in a hydrogen atom? (1)

3. The radius of innermost electron orbit of a hydrogen atom is 5.3×10^{-11} meter.What is the radius of orbit in the second excited state? (1)

4. Find the ratio of energies of photons produced due to transition of an electron of hydrogen atom from its
(i) second permitted energy level to the first level, and
(ii) the highest permitted energy level to the first permitted level(1)

5. The ground state energy of hydrogen atom is -13.6 eV. What are the kinetic and potential energies of electron in this state? (1)

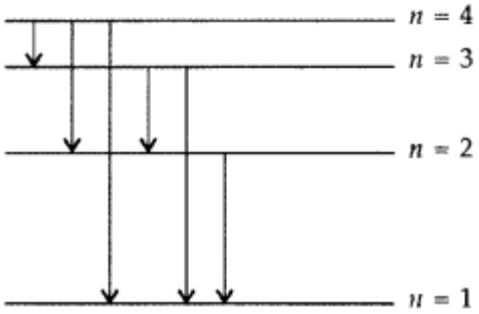
6. i) In hydrogen atom, an electron undergoes transition from 2nd excited state to the first excited state and then to the ground state. Identify the spectral series to which these transitions belong.
(ii) Find out the ratio of the wavelengths of the emitted radiations in the two cases. (2)

7. Using Rutherford model of the atom, derive the expression for the total energy of the electron in hydrogen atom. What is the significance of total negative energy possessed by the electron? (3)

8. Show that the radius of the orbit in hydrogen atom varies as n^2, where n is the principal quantum number of the atom. (2)

9. Calculate the shortest wavelength in the Balmer series of hydrogen atom. In which region (infra-red, visible, ultraviolet) of hydrogen spectrum does this wavelength lie? (3)

10. The figure shows energy level diagram of hydogen atom



(a) Find out the transition which results in the emission of a photon of wavelength 496 nm.
(b) Which transition corresponds to the emission of radiation of maximum wavelength? Justify your answer. (3)

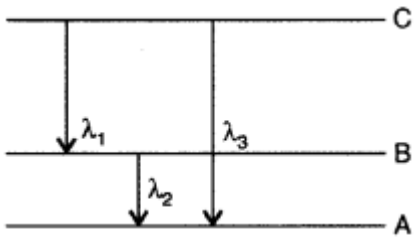
11. An α-particle moving with initial kinetic energy K towards a nucleus of atomic number z approaches a distance ‘d’ at which it reverses its direction. Obtain the expression for the distance of closest approach ‘d’ in terms of the kinetic energy of α-particle K. (2)

12. Find the ratio between the wavelengths of the ‘most energetic’ spectral lines in the Balmer and Paschen series of the hydrogen spectrum. (2)

13. Write two important limitations of Rutherford nuclear model of the atom. (2)

14. The ground state energy of hydrogen atom is -13.6 eV.
(i) What is the kinetic energy of an electron in the 2^{nd} excited state?
(ii) If the electron jumps to the ground state from the 2^{nd} excited state, calculate the wavelength of the spectral line emitted. (3)

15.. State Bohr's quantization condition for defining stationary orbits. How does de-Broglie hypothesis explain the stationary orbits?
(ii) Find the relation between the three wave-lengths λ_1, λ_2 and λ_3 from the energy level diagram shown below: (Delhi 2016)



(3)

ENGLISH

Q1. In a group of 5, students will prepare a PPT on a topic selected out of the following. [Minimum 12 slides including introduction and conclusion.]
1. Grand Central Station
2. Franco-Prussian war [fought in 1870-71]
3. Gandhi and Champaran
4. Galesburg
5. Seemapuri

Q2. Write at least 5 of each in your writing notebook.
• Notice writing
• Letter to editor and
• Job application [only two to be done]
(ATTEMPT FROM THE GIVEN QUESTIONS FROM EACH CATEGORY)

NOTICE WRITING	
1.	As Sports Secretary of G.D.G. Public School, Pune, draft a notice in not more than 50 words for your school notice board informing the students about the sale of old sports goods of your school. You are Rohini/Rohit.

2.	Water supply will be suspended for eight hours (10 am to 6 pm) on 6th of June for cleaning of the water tank. Write a notice in about 50 words advising the residents to store for a day. You are Karan Kumar/Karuna Bajaj, Secretary Janata Group Housing Society, Palam Vihar, Kurnool.
3.	Sarvodaya Education Society, a charitable organization is coming to your school to distribute books among the needy students. As Head Boy/Head Girl, Sunrise Public School, Surat, write a notice in about 50 words asking such students to drop the lists of books they need in the box kept outside the Principal's office. You are Navtej/Navita
4.	You are Rameshwarm/Rameshwari, Secretary, Literary Club of A.B.C. School, Vikaspuri. Your schoolmate, Gautam Adhikari, a budding writer, has won the first prize in the State Story Writing Competition. The club has decided to organise a function to felicitate him on his laudable achievement. Write a notice in not more than 50 words, informing all the students of your school about the function and urge them to attend it to make the occasion memorable. Give all the necessary details.
5.	You are Tripti/Trilok Lahiri, Secretary, ABL School Cricket Association. It has been decided that a meeting of all the members of the school cricket team be held to discuss plans and strategies for the coming Zonal Tournament. Write a notice in not more than 50 words informing the members of the team about the meeting and requesting them to attend it.
6.	You have lost your leather wallet containing your examination entry ticket for Class XII, while travelling by bus from Banshankari to M.G. Road in Bangalore, Write a notice in not more than 50 words.
7.	You are Secretary of J. P. Narain Housing Society, R.W.A., Meerut. Draft a notice in not more than 50 words stating that the second installment of maintenance charges falls due on 31st June, 2023, and requesting the members to pay before the due date. Sign as Anil/Anita.

LETTERS TO EDITOR	
1.	Yesterday you went to Sunrise Hospital, Market Road, New Delhi taking with you victim of a hit and run accident. There were chaotic conditions in the casualty department. The injured was attended to

	after a significant amount of precious time had been lost. Write a letter of complaint in 120-150 words to the Medical Superintendent. You are Karan/Karuna, M-114, Mall Road, Delhi.
2.	Lack of job opportunities in the rural areas is forcing people to migrate to cities. Every big city thus has a number of slums in it. Life in these slums is miserable. Write a letter in 120-150 words to the editor of a national newspaper on how we can improve the living conditions in these slums. You are Karan/Karuna, M-114, Mall Road, Delhi.
3.	Along with air and water pollution, our cities are also under an attack of noise pollution. Marriage processions, DJs during wedding receptions, loud music from neighborhood flats, etc. are all source of noise which is not good for the old, the ailing and students. Write a letter in 120-150 words to the editor of a local newspaper describing the problem and making a request to the concerned authorities to solve it. Your are Karan/Karuna, M-114, Mall Road, Delhi.
4.	It gives you a good feeling when you read in the newspapers how patients from abroad come to hospitals in India and get themselves treated at a fraction of expenses they will have incurred elsewhere. Write a letter in 120- 150 words to the editor of a national daily describing the importance of medical tourism for India. You are Karan/Karuna M-114, Mall Road, Kanpur.
5.	Our rivers are much polluted. Industries and sewage from our houses are polluting them. What can we do to save our rivers? Write a letter in 120-150 words to the editor of a national newspaper describing the problem and suggesting solutions to it. You are Karuna/ Karan, M-114, Mall Road, Delhi.
6.	Recently you went to your native village to visit your grandparents. You saw that some of the children in the age group 5 -14 (the age at which they should have been at school) remained at home, were working in the fields or simply loitering in the streets. Write a letter in 120-150 words to the editor of a national daily analysing the problem and offering solutions to it. You are Navtej/Navita, M-114, Mount Kailash, Kanpur.
7.	Despite all the incentives the government is providing to encourage education of the girl child, the number girls in the rural schools is not rising to the desired level. Write a letter to the Editor of national

	daily giving your views on the problem. Make a few suggestions on how the situation can be improved. You are Rani/ Raj, 121 Main Street, Kanpur.

APPLICATION FOR JOB	
1.	You have read an advertisement in "The National Times" for the post of Chartered Accountant in Happy Times Industry, Kanpur. You believe you possess the requisite qualifications and experience and would prove to be an asset to the company. Apply for the post giivng your complete bio-data stressing your suitability. You are Amrendera Siingh of 2, Kailash Puri, Delhi.
2.	The Bhagat Singh Foundation is recruiting graduates for an intensive leadership training programme during the summer, in villages across India. You are Anjana/ Anshu from 21, Ratnapur Village, Bilaspur. You are very excited to see the advertisement and decide to apply for the same. Draft a letter in 120-150 words applying for the advwertised programme. Include a biodata showing how suitable you are for the training.
3.	You are Anand/Arti of 14, Model Town, Delhi. You have seen advertisement in 'The Hindu' for the post of Chief Chef ina 5-star Hotel. Apply for the job with complete bio-data. Write in 120-150 words.
4.	You are Prem/Parul of 16, TT Nagar, Bhopal. You would like to apply for the post of Marketing Manager in a reputed firm in Mumbai. Write a letter to the Public Relations Officer. Chantac Enterprises, Mumbai, applying for the job. Write the letter in 120-150 words giving your biodata.

***BUSINESS* STUDIES-**

Project work in Business studies will make our students more updated as each project here is to enhance their different skills and approach towards subject matter and practical content.

- Inculcate skills of team work,problem solving,time management,information collection,processing,analysis and synthesizing relevant information.
- Make your studies enjoyable and cherish.
- Get involved in the process of research work,demonstrate your capabilities.

(ANY ONE PROJECT)

I. Project One: Elements of Business Environment

1. Changes witnessed over the last few years on mode of packaging and its economic impact. The teacher may guide the students to identify the following changes:

a) The changes in transportation of fruits and vegetables such as cardboard crates being used in place of wooden crates, etc. Reasons for above changes.

b) Milk being supplied in glass bottles, later in plastic bags and now in tetra-pack and through vending machines.

c) Plastic furniture [doors and stools] gaining preference over wooden furniture.

d) The origin of cardboard and the various stages of changes and growth. e) Brown paper bags packing to recycled paper bags to plastic bags and cloth bags.

f) Re use of packaging [bottles, jars and tins] to attract customers for their products.

g) The concept of pyramid packaging for milk.

h) Cost being borne by the consumer/manufacturer.

i) Packaging used as means of advertisements.

2. The reasons behind changes in the following: Coca – Cola and Fanta in the seventies to Thumps up and Campa Cola in the eighties to Pepsi and Coke in nineties. The teacher may guide the students to the times when India sold Coca Cola and Fanta which were being manufactured in India by the foreign companies.

The students may be asked to enquire about

a) Reasons of stopping the manufacturing of the above-mentioned drinks in India THEN.

b) The introduction of Thumps up and Campa cola range.

c) Re-entry of Coke and introduction of Pepsi in the Indian market.

d) Factors responsible for the change.

e) Other linkages with the above.

f) Leading brands and the company having the highest market share.

g) Different local brands venturing in the Indian market.

h) The rating of the above brands in the market.

i) The survival and reasons of failure in competition with the international brands.

j) Other observations made by the students

3. Changing role of the women in the past 25 years relating to joint families, nuclear families, women as a bread earner of the family, changes in the requirement trend of mixers, washing machines, micro wave and standard of living.
4. The changes in the pattern of import and export of different Products.
5. The trend in the changing interest rates and their effect on savings.
6. A study on child labour laws, its implementation and consequences.
7. The state of 'anti plastic campaign,' the law, its effects and implementation.
8. The laws of mining /setting up of industries, rules and regulations, licences required for running that business.
9. Social factors affecting acceptance and rejection of an identified product. (Dish washer, Atta maker, etc)
10. What has the effect of change in environment on the types of goods and services? The students can take examples like: a) Washing machines, micro waves, mixers and grinder.
b) Need for crèche, day care centre for young and old.
c) Ready to eat food, eating food outside, and tiffin centres.
11. Change in the man-machine ratio with technological advances resulting in change of cost structure.

12. Effect of changes in technological environment on the behaviour of employee.

II. Project Two: Principles of Management

The students are required to visit any one of the following:

1. A departmental store.

2. An Industrial unit.

3. A fast food outlet.

4. Any other organisation approved by the teacher. They are required to observe the application of the general Principles of management advocated by Fayol.

Fayol's principles 1. Division of work. 2. Unity of command. 3. Unity of direction. 4. Scalar chain 5. Espirit de corps 6. Fair remuneration to all. 7. Order. 8. Equity. 9. Discipline 10. Subordination of individual interest to general interest. 11. Initiative. 12. Centralisation and decentralisation. 13. Stability of tenure.

OR

They may enquire into the application of scientific management techniques by F.W. Taylor in the unit visited.

Scientific techniques of management. 1. Functional foremanship. 2. Standardisation and simplification of work. 3. Method study. 4. Motion Study. 5. Time Study. 6. Fatigue Study 7. Differential piece rate plan.

III. Project Three: Stock Exchange

The purpose of this project is to teach students the values of investing and utilising the stock market.

a) Develop a brief report on History of Stock Exchanges in India. (your country)
b) Prepare a list of at least 25 companies listed on a Stock Exchange.

c) To make an imaginary portfolio totalling a sum of Rs. 50,000 equally in any of the 5 companies of their choice listed above over a period of twenty working days.

The students may be required to report the prices of the stocks on daily basis and present it diagrammatically on the graph paper. They will understand the weekly holidays and the holidays under the Negotiable Instruments Act. They will also come across with terms like closing prices, opening prices, etc. During this period of recording students are supposed to distinctively record the daily and starting and closing prices of the week other days under the negotiable instrument act so that they acquire knowledge about closing and opening prices. The students may conclude by identifying the causes in the fluctuations of prices. Normally it would be related to the front page news of the a business journal, for example,

Change of seasons. Festivals. Spread of epidemic. Strikes and accidents Natural and human disasters. Political environment. Lack of faith in the government policies. Impact of changes in government policies for specific industry. International events. Contract and treaties at the international scene. Relations with the neighbouring countries. Crisis in developed countries, etc.

The students are expected to find the value of their investments and accordingly rearrange their portfolio. The project work should cover the following aspects; 1. Graphical presentation of the share prices of different companies on different dates. 2. Change in market value of shares due to change of seasons, festivals, natural and human disasters. 3. Change in market value of shares due to change in political environment/ policies of various countries/crisis in developed countries or any other reasons 4. Identify the top ten companies out of the 25 selected on the basis of their market value of shares. It does not matter if they have made profits or losses.

IV. Project Four: Marketing

The students must ensure that the identified product should not be items whose consumption/use is discouraged by the society and government like alcohol products/pan masala and tobacco products, etc. (student can take any other product or service in addition to the above mentioned list)

Identify one product/service which the students may like to manufacture/provide [pre-assumption].

Now the students are required to make a project on the identified product/service keeping in mind the following: 1. Why have they selected this product/service? 2. Find out '5' competitive brands that exist in the market. 3. What permission and licences would be required to make the product? 4. What are your competitors Unique Selling Proposition. [U.S.P.]? 5. Does your product have any range give details? 6. What is the name of your product? 7. Enlist its features. 8. Draw the 'Label' of your product. 9. Draw a logo for your product. 10. Draft a tag line. 11. What is the selling price of your competitor's product? (i) Selling price to consumer (ii) Selling price to retailer (iii) Selling price to wholesaler What is the profit margin in percentage to the Manufacturer? Wholesaler. Retailer. 12. How will your product be packaged? 13. Which channel of distribution are you going to use? Give reasons for selection? 14. Decisions related to warehousing, state reasons. 15. What is going to be your selling price? (i) To consumer (ii) To retailer (iii) To wholesaler
16. List 5 ways of promoting your product. 17. Any schemes for (i) The wholesaler (ii) The retailer (iii) The consumer 18. What is going to be your 'U.S.P? 19. What means of transport you will use and why? 20. Draft a social message for your label. 21. What cost effective techniques will you follow for your product. 22. What cost effective techniques will you follow for your promotion plan. At this

stage the students will realise the importance of the concept of marketing mix and the necessary decision regarding the four P's of marketing. Product Place Price Promotion
On the basis of the work done by the students the project report should include the following: 1. Type of product /service identified and the (consumer/industries) process involve their in. 2. Brand name and the product. 3. Range of the product. 4. Identification mark or logo. 5. Tagline. 6. Labelling and packaging. 7. Price of the product and basis of price fixation. 8. Selected channels of distribution and reasons thereof. 9. Decisions related to transportation and warehousing. State reasons. 10. Promotional techniques used and starting reasons for deciding the particular technique. 11. Grading and standardization.

Presentation and Submission of Project Report At the end of the stipulated term, each student will prepare and submit his/her project report.

CHEMISTRY

1. Complete the investigatory project.
2. Complete the practical file.
3. Prepare an art integrated project on Fuel cells and its importance.
4. Complete the assignment given below:

CHEMISTRY ASSIGNMENT

- PART 1- SOLUTIONS

Ques 1 : one kg of sea water sample contains 6mg of dissolved O2. The concentration of O2 in ppm in the sample is:

1. 0.06
2. 60
3. 6
4. 0.6

Ques 2: On dissolving sugar in water at room temperature solution feels cool to touch. Under which of the following cases dissolution of sugar will be most rapid?

1. Sugar crystals in cold water.

2. Sugar crystals in hot water.
3. Powdered sugar in cold water.
4. Powdered sugar in hot water.

Ques 3: Why aquatic animals are more comfortable in cold water than in warm water?

Ques 4: why is air diluted with helium in the tanks used by scuba divers?

Ques 5: i. Why osmotic pressure method is preferred for the determination of molecular masses of macromolecules such as protein and polymers?

ii. What happens when Pressure greater than osmotic pressure is applied on the solution side separated from solvent by a semi permeable membrane?

Ques 6: Visha took two aqueous solutions – one containing 7.5 gram of urea molar mass 60 gram per mole and the other containing 42.75 gram of substance Z in 100 gram of water respectively. It was observed that both the solution froze at the same temperature, calculate the molar mass of Z.

Ques 7: one gram of a non-electrolyte solute dissolved in 50 gram of benzene lower the freezing point of benzene by 0.40 K the freezing point depression constant of benzene is 5.12 K kg per mole find the molar mass of the solute.

Ques 8: solution containing 12.48 gram of barium chloride in one kg of water boils at 373.0832 K calculate the degree of dissociation of barium chloride (given K_B for H_2Oequals to 0.52K kg/mol molar mass of $BaCl_2$ equals to 208.34 gram per mole)

Ques 9: Determine the osmotic pressure of a solution prepared by dissolving 2.5 x 10^{-10} gram of K_2SO_4 in 2 litre of water at 25 degree C assuming that it is completely dissociated.

Ques 10: 1 molal aqueous solution of trichloroacetic acid is heated to its boiling point. The solution has a boiling point of 100.18 degrees Celsius, determine the vant hoff factor for trichloroacetic acid (Kb for water = 0.512 K Kg per mole).

- PART 2- ELECTROCHEMISTRY

Ques 1: an electrochemical cell behave like an electrolytic cell when:

1. Ecell = Eexternal
2. Ecell = 0
3. Ecell > Eext
4. Ecell < Eext

Ques 2: standard reduction potential 298 Kelvin for a single electrode are given below:

Mg^{2+}/Mg = -2.34 V

Zn^{2+}/ Zn = -0.76 V

Fe^{2+}/Fe = -0.44 V

From this we can infer that:

1. Zn can reduce both Mg2+ and Fe2+
2. Fe can reduce both Mg2+ and Zn2+
3. Mg can reduce both Zn2+ and Fe2+
4. Mg can reduce Zn2+ but not Fe2+

Ques 3: Conductivity of acetic acid decreases on dilution. Why?

Ques 4: Calculate Ecell for the following reaction at 298 K.

$2Al + 3\ Cu^{2+}\ (0.01M) \rightarrow 2Al^{3+}\ (0.001M) + 3Cu.$

Ques 5: for the cell reaction, Ni|Ni2+||Ag+|Ag

The equilibrium constant at 25 degrees Celsius and how much maximum work would be obtained by operation of this cell. EAg+/Ag = 0.80 V ; EFe3+/Fe2+ =0.77V.

Ques 6: Can silver nitrate solution be stored in an aluminium container?

Ques 7: Define the terms conductivity and molar conductivity for the solution of an electrolyte. Comment on their variation with concentrations.

Ques 8: out of the following pairs predict with reason which pair will allow greater conduction of electricity:

i. Silver wire at 30 C or silver wire at 60 C.
ii. 0.1 M CH_3COOH solution or 1 M CH_3COOH solution
iii. KCl solution at 20C or KCl solution at 50C

Ques 9: calculate the degree of dissociation ά of acetic acid, molar conductivity Λm is 39.05 S cm2 mol-1 (given λ_{H+} = 349.68 S cm2 mol-1, $\lambda_{CH3COO-}$ = 40.9 Scm2 mol-1).

Ques 10. A Zinc rod is dipped in 0.1 M solution of $ZnSO_4$ the salt is 95% dissociated at this dilution at 298 K, Calculate the electrode potential. Ezn2+/zn = -0.76V

PHYSICAL EDUCATION

WRITE THE FOLLOWING PRACTICALS IN YOUR FILE . SUBMIT IT BY 15 JULY 2023.

1. Any one game of your choice. Labelled diagram of field and equipment rules, terminologies& skills (basketball, football, kabaddi, kho-kho, volleyball, handball, cricket and children with special needs)
2. Fitness tests administration. (SAI Khelo India Test)
3. Procedure for Asanas, benefits and contraindication for any 5 asanas for each lifestyle disease.
4. Sports Injuries .

*Make a chart any one game of your choice. Labelled diagram of field and equipment rules, terminologies& skills (basketball, football, kabaddi, kho-kho, volleyball, handball, cricket and children with special needs)

ECONOMICS

1. Collect case study material for the topic allotted to you for Annual Practical Examination 2024.
2. Solve all the numerical questions from your textbook in a separate notebook (100 pages). Solve at least 10 unsolved questions based on each method of measuring National Income.
3. Prepare the list of formulae and flowcharts at the back of the class register or in separate sheets.

4. Complete, revise and learn the all chapters done before holidays.
   Part A: Introductory Macro Economics

MATHEMATICS

1.ACTIVITY:To verify Rolle's Theorem.
2.ACTIVITY:To construct the graph of inverse trigonometrc function [using proper measurement].Write Domain and principle value.
3.ACTIVITY:To verify thatamongst all the rectanglesof the same perimeter,the square has the maximum area.
4.Please do solve these questions.
ASSIGNMENT -5(APPLICATION OF DERIVATIVE) AOD
Q1 .A balloon, which always remains spherical, has a variable radius. Find the rate at which its volume is increasing with respect to its radius when the radius is 7 cm.
Q2. The total cost C(x) associated with the production of x units of an item is given by C(x) = 0.005 x3 – 0.02 x2 + 30x + 5000 Find the marginal cost when 3 units are produced, where by marginal cost we mean the instantaneous rate of change of total cost at any level of output.
Q3 Anair force plane is ascending vertically at the rate of 100 km/h. If the radius of the earth is r km, how fast is the area of the earth, visible from the plane, increasing at 3 minutes after is started ascending ? Given that the visible area A at height h is given by 2 h A 2 r r h =π+ .
Q4 A man 2 meters high, walks at a uniform speed of 6 meters per minute away from a lamp post, 5 meters high. Find the rate at which the length of his shadow increases
Q5 An inverted cone has a depth of 10 cm and a base of radius 5 cm. Water is poured into it at the rate of 3/2 c.c. per minute. Find the rate at which the level of water in the cone is rising when the depth is 4 cm.
Q6. Find the intervals in which f(x) = -x 2 – 2x +15 is increasing or decreasing ,
Q7. Find the intervals in which the function f(x) is (i) increasing, (ii) decreasing : f(x) = 2x3 – 9x2 + 12x + 15 .
Q8. Find the intervals in which the function f given by f(x) = sin x + cos x, $0 \le x \le 2\pi$ is increasing or decreasing.

Q9. Find the intervals in which f(x) = 2 log (x – 2) – x 2 + 4x + 1 is increasing or decreasing.

Q10 CASE STUDY

The Relation between the height of the plant (y in cm) with respect to exposure to sunlight is governed by the following equation y = 4x - 1 2 x 2 where x is the number of days exposed to sunlight

1. The rate of growth of the plant with respect to sunlight is _____ .

a. 4x-1/ 2 x 2 b. 4 – x c. x – 4d. x - 1 2 x 2

2. What is the number of days it will take for the plant to grow to the maximum height?

a. 4 b. 6 c. 7 d. 10

3. What is the maximum height of the plant? a. 12 cm b. 10 cm c. 8 cm d. 6 cm 4. What will be the height of the plant after 2 days?

a. 4cm b. 6 cm c. 8cm d. 10cm

5. If the height of the plant is 7/2 cm, the number of days it has been exposed to the sunlight is _____ .

a. 2 b. 3 c. 4 d. 1

PSYCHOLOGY

1. Attempt all the questions.
2. Maintain the sequence and number the answers to the questions accordingly.
3. Attempt the HOTS questions on page 5 creatively.
4. Complete the practical file work of the following:
    i. MPI
    ii. SCAT
5. Read chapter 1 & 2 carefully and learn the key words.

BIOLOGY

Select a topic for investigatory project report and make a report including the following headings:

- Theory
- Materials Required
- Procedure
- Observations/Observation Table
- Conclusion
- Result

1. Do the given assignment in your Biology notebook:

ASSIGNMENT

1. Due to congenital defect, a woman does not have fimbriae in the fallopian tube. How will it affect her?
2. What is the difference between spermatogenesis and spermiation?
3. What is the role of LH in a human male and female?
4. Justify with reason:
   a. Corpus luteum secretes large amounts of progesterone if egg is fertilized.
   b. During pregnancy there is an increase in the levels of hormones like estrogen, progesterone, cortisol, prolactin, thyroxine, etc. in maternal blood.
   c. Colostrum is absolutely essential for the newborn.
   d. Placenta can be referred to as 'transporting organ'.
5. List out the sequence of events after fertilization until implantation of the human embryo.
6. How many primary follicle will be there at the time of puberty in the human ovary?

POLITICAL SCIENCE

- Read the questions carefully and answer them
- All questions are compulsory
- All questions carry marks
- Use A4 size (white) sheet to write assignment

Q-1 Mention any two characteristics of the Soviet political and social system. (2)

Q-2 What is ASEAN vision 2020? (2)

Q-3 Examine the role of sardar Vallabhbhai Patel as iron man of India. (2)

Q-4 How did China rise to be an economic superpower? Justify the answer with three examples. (3)

Q-5 Explain any three consequences of partition of British India in 1947. (3)

Q-6 Explain any three challenges faced by India at the time of its independence. (3)

Q-7 During the Cold war era India and the USSR enjoyed a multidimensional relationship. Support the statement with three examples. (3)

Q-8 How did the Soviet Union suddenly disintegrate? Explain any six reasons. (6)

Q-9 Examine the political and diplomatic, economic and military influence of the European union. Discuss in detail. (6)

COMPUTER SCIENCE

1. Do the text book exercise of chapter 2 Functions and Chapter 4 Data File Handling in the computer science register.

2. For the practical file do programs from chapter 1,2 and 4.
   Program concepts for functions:-
   Types of Arguments
   Scope of Variable
   Passing mutable/immutable types as parameters

   Program concepts for file handling:-
   TEXT FILE -Three or more (READING/WRITING /SEARCHING)
   CSV FILE -Two or more (READ/WRITE/SEARCH)

BINARY FILE -two or more2(READ/WRITE /UPDATE/DELETE)

3. Theme Based :- Create a user interface to collect and store data about famous tourist
destinations of Andaman and Nicobar Islands and store them in a csv file named
exploreAN.csv.
Let the user enter information about at least five tourist places and present the report after
reading from csv file as:
Explore: Andaman and Nicobar Islands (A Travel Log)

INFORMATICS PRACTICES

1. Do the text book exercise of chapter 1 DATA HANDLING WITH PANDAS in informatics practices register .

2. For the practical file do programs from chapter 1 on following concepts
a. Series Creation
b. Series Operations
c. DataFrame Creation methods
d. DataFrame operations.

3. Theme Based :- Create a user interface to collect and store data about famous tourist
destinations of Andaman and Nicobar Islands and store them in a csv file named
exploreAN.csv.
Let the user enter information about at least five tourist places and present the report after

reading from csv file as:
Explore: Andaman and Nicobar Islands (A Travel L(2og)

GEOGRAPHY

1. Prepare 10 Multiple Choice Questions from each of the following chapters in Practice notebook of Geography.
    - Human Geography: Nature & Scope
    - World Population: Distribution, Density and Growth .
    - Human Development
    - Primary Activities
    - Secondary Activities
2. Do 10 numericals of Mean & Median each (for all series) in Practice notebook of Geography.
3. Prepare practical record file with written assignment for all chapters.(Use Black Gel Pen only)
4. Express your views regarding the concept of “Human Development” on the basis of criterion given by UNDP in Geography notebook. (Word limit : 200 words)

ACCOUNTANCY

Q.1 Mukesh, Ratan, Anil, and Birla were equal partners. Their capitals on 1st April 2021 were as follows:

Mukesh Rs.3,00,000; Ratan Rs.2,90,000; Anil Rs.3,10,000 and Birla Rs.2,70,000 respectively.

On 30th June 2021 Mukesh withdrew from his capital Rs.20,000 for personal use

On 31st Dee. 2021 Ratan withdrew Rs. 10,000 for personal use against the anticipated profit

On31stJan. 2022 Anil withdrew Rs.30,000 for personal use against the anticipated profit.

On 1 Feb. 2022 Birla introduced Rs.30,000 as his additional capital

You are required to calculate interest on capital @ 10% p.a. on 31st March 2022.

Ans: interest on capital of Mukesh=28500, Ratan=29000, Anil=31000, and Birla=27500.

Q.2 Garry. Harry and Robert were partners in a firm sharing profits in the ratio of 7:4:9. Their capitals on 1st April 2021 were: Garry Rs.2,00,000; Harry Rs. 75,000 and Robert Rs.3,50,000. Their partnership deed provided for the following:

(i) 10% of the net profit to be transferred to the General Reserve.

(ii) Interest on capital is to be allowed @ 9% p.a.

(iii) Salary of Rs.6,000 per month to Harry.

(iv) Interest on Drawings @ 6% p.a.

Drawings made against the anticipated profits, by Garry during the year Rs.25,000, Harry withdrew Rs.5,000 at the end of each quarter, Robert withdrew Rs. 25,000 on 1st June 2021 for personal use. During the year ended 31st March 2022 the firm earned a profit of Rs.1,70,000.

Prepare Profit and Loss Appropriation Account. **Ans:**Divisible profit 9520,5440,12240

Q.3 PK, SK and RK are partners having fixed capitals of Rs.2,00,000; Rs.1,60,000 and Rs.1,20,000 respectively on 1st April 2021. They share profits in the ratio of 3:1:1. The partnership deed provide for the following which were not recorded in the books.

(I) Interest on capital @5 % p.a.

(II) Salary to PK Rs.1,500 per month and to RK 1,000 per month

(III) 10% of the Net profit is to be transferred to the General Reserve

Net profit for the year ended 31st March 2022 was Rs.1,00,000 which was shared directly in the profit-sharing ratio without providing the above. Give an adjustment entry.

Ans:PK current a/c ---Dr. 10400 SK current a/c ----Dr. 4800, RK current a/c---Cr.5200 General reserve ---Cr 10000.

Q.4 On 1st April 2020, a business firm had assets of ₹ 1,50,000 including cash of ₹10,000. The partners' Capital Account showed a balance of ₹12,000 and the reserve constituted the rest. If the normal rate of return is 10% and the goodwill of the firm is valued at ₹48,000 at four years purchase of super profits. Find the average profits of the firm at the time at the time of retirement of a partner.
Ans: Average profit= 27000

Q.5 Compute the value of goodwill for al partnership firm, when new partner admitted, by using the capitalization of super profit method from the following figures:

Average Capital Employed ₹60.000

Normal Rate of Return 20%

A. When average profit was 24,000.

B. When average profit was 10,000.

Ans: A. Goodwill= 60000

B. no goodwill because super profit is negative

Q.6 David, John and King were partners sharing profits and losses in the ratio of 5 : 3: 2. They decided to share future profits and losses in the ratio of 2 : 3: 5 with effect from 1st April 2020. They decided to record the effect of the following without affecting their book values:

Profit and loss account (Cr. balance) ₹48.000

Preliminary expense ₹12,000

Advertisement suspense account ₹18,000

Pass the necessary adjusting entry.

Ans: King's capital a/c---Dr. 5400 David's Capital A/c ---Cr. 5400

Q.7 Write all the formulas for Methods of valuation of Goodwill.

कक्षा **12** हिंदी **(2023-24)**
ग्रीष्मकालीन गृह कार्य

सामान्य निर्देश**:-**
1. परियोजना कार्य A4 साइज शीट पर कीजिए.
2. सुंदर लेख ध्यान दीजिए
3. प्रथम पृष्ठ पर सभी विद्यार्थी अपना परिचय दीजिए.
4. परियोजना कार्य को MY CLEAR बैग में रखिए.

• निम्नलिखित विषयों पर लगभग 100 से 150 शब्दों में लेख लिखिए?
1- भारत के सजग नागरिक
2- किसान का संघर्ष
3- गांव से शहरों की ओर बढ़ रहा पलायन
4- हताशा में आशा की किरण युवा
5- बस्ते का बढ़ता बोझ
6- महानगरों में प्रदूषण की समस्या
7 - 'पर्यावरण हे तो मानव है 'विषय को आधार बनाकर पर्यावरण सुरक्षा को लेकर आप क्या प्रयास कर रहे हैं? विस्तार से लिखिए।
8- कंप्यूटर तथा मोबाइल मनोरंजन के साथ-साथ हमारी जरूरत का साधन अधिक बन गए हैं। इन से मिलने वाले लाभों तथा हानियों का वर्णन करते हुए अपने विचार लिखिए।

परियोजना कार्य:-
1- विस्थापन क्या है,इसकी समस्या से आप कहां तक परिचित हैं। किसी विस्थापन संबंधी समस्या पर एक रिपोर्ट तैयार कीजिए?
2 - बनारस कविता के आधार पर बनारस के बारे में लिखिए एवं सचित्र सहित बनारस की विशेषता का उल्लेख कीजिये?
3- जी-20 सम्मेलन क्या है इसकी विशेषता बताते हुए शामिल देशों के नामों का उल्लेख करते हुए जी-20 सम्मेलन में भारत की क्या भूमिका है एक परियोजना कार्य तैयार कीजिए।
4- भारत में ऋतु का चक्र बताइए और उनके लक्षण लिखिए तथा ऋतु संबंधी छाया चित्र बनाते हुए ऋतु की विशेषताएं भी लिखें।
5- संस्मरण साहित्य क्या है ,हिंदी साहित्य में किन किन कवियों ने संस्मरण लिखे हैं उनके बारे में जानकारी देते हुए परियोजना कार्य कीजिए।
6-हिंदी कविता में प्रकृति चित्रण का वर्णन कीजिए।विभिन्न कवियों की कविताओं का तुलनात्मक अध्ययन करते हुए उनकी भाषा शैली व विशेषताओं का परिचय देते हुए परियोजना कार्य कीजिए
7- भारतीय ग्रामीण जीवन मेंआजादी से पहले, बाद में तथा वर्तमान में क्या स्थिति है और इसमें सुधार की क्या आवश्यकता है।इसमें आपकी क्या भूमिका या योगदान हो सकता है ।