SHREE VASISHTHA VIDHYALAYA

English Medium-CBSE

Class-XII (Science)

Summer Assignment 2025 - 26

Classes XI–XII

Dear Students,

As the summer sun shines brighter and the days grow longer, it's time to pause, relax, and recharge. The summer break offers a wonderful opportunity to reflect, grow, and stay creatively engaged.

To keep the spirit of learning alive, we've designed interesting, research-based holiday homework that encourages independent thinking and curiosity. Remember, every learner is unique — and progress matters more than perfection.

📖 *Read & Rise!*

Use this break to explore books that inspire and build character:

- *You Can Win – For self-motivation*
- *Ikigai – To discover your purpose*
- *The Secret – To adopt positive thinking*
- *Eat That Frog – To overcome procrastination*

Reading a few pages each day can go a long way in shaping your mindset and habits.

✅ *Smart Break Tips:*

- *Balance your day with study, rest, and hobbies*
- *Prioritize important tasks and work steadily*
- *Maintain a clean and focused study space*
- *Don't hesitate to ask for help when needed*
- *Be consistent — little progress each day adds up*

🌤️ *Enjoy, Learn, and Grow*

Make the most of your time — rest well, explore something new, and return refreshed with fresh energy and a positive mindset. Your effort and enthusiasm today shape your success tomorrow.

Wishing you a joyful and productive summer break!

Warm regards,

SVV Family

Wishing you a meaningful and magical summer!

"Summer brings the time to rest, But learning too can be at its Best!"

SUMMER ASSIGNMENT: 2025-26
Class: XII (Science Stream)

General Instructions:-

1. **All the subject assignments have to be done in separate files using project papers.**
2. **Submission date:- 13th June, 2025 (Friday)**
3. **The Summer Break is scheduled from 04th May 2025 - 05th June, 2025. The students will resume the school from 6th June, 2025 (Friday).**

Note:- These assignments are a part of your internal assessment & will be marked accordingly out of 10.

ENGLISH CORE (301)

Q1. To encourage students to participate in outdoor activities, your school has planned a 7-day trek to Rohtang Pass for students of classes VIII-X during the summer vacation. Write a notice for the school notice board giving all the necessary information. You are Raghav/Ragini, Secretary Trekking Club, Amar Bahadur School.

Q2. The problem of the residents' parking of vehicles, often leading to minor scuffles, has become a source of growing concern. As Secretary of Goodwill Flats Welfare Association, Shripur, write a notice informing the residents about a meeting to discuss the problem and find an acceptable solution. Invent necessary details.

Q3. You are Bala/Bandhini, school counsellor of Bala Vidyagram School, Dharti Bagh. Your school is organising a Career Counselling Fair. Write a notice encouraging students to attend the fair. Mention the benefits and include necessary details.

Q4. Write a notice to invite class XI students to a special assembly to facilitate the sports stars of your school with badges of honour. Renowned cricketer Sahil Singla would be the Chief Guest at the occasion. Share necessary details about the event. You are Rohini/Rohan, President of the Student Council of Bal Mahal School, Roshni Nagar.

Q5. The people in this story suddenly realise how precious their language is to them. What shows you this? Why does this happen?

Q6. Franz thinks, "Will they make them sing in German, even the pigeons?" What could this mean?

Q7. How is Mukesh's attitude to his situation different from that of his family?

Q8. Would you agree that promises made to poor children are rarely kept? Why do you think this happens in the incidents narrated in the text?

Q9. What is the kind of pain and ache that the poet feels?

Q10. What is the exotic moment the poet Pablo Neruda wishes for?

PHYSICS (042)

Q1. An optical instrument uses an objective lens of power 100 D and an eyepiece of power 40 D. The final image is formed at infinity when the tube length of the instrument is kept at 20 cm. (a) Identify the optical instrument. (b) Calculate the angular magnification produced by the instrument.

Q2. In a single slit diffraction experiment, the width of the slit is decreased. How will the (i) size (ii) intensity of the central bright band be affected? Justify your answer.

Q3. (a) Two thin lenses are placed coaxially in contact. Obtain the expression for the focal length of this combination in terms of the focal lengths of the two lenses. (b) A converging lens of refractive index 1.5 has a power of 10 D. When it is completely immersed in a liquid, it behaves as a diverging lens of focal length 50 cm. Find the refractive index of the liquid.

Q4. An object is placed 30 cm in front of a Plano-convex lens with its spherical surface of radius of curvature 20 cm. If the refractive index of the material of the lens is 1·5, find the position and nature of the image formed.

Q5. Give reasons for each of the following: (a) The intensity of light at some points on the screen in Young's double slit experiment is zero. (b) In the single slit diffraction experiment, some coloured fringes around the central white maximum are observed on the screen when one uses a source of white light. \

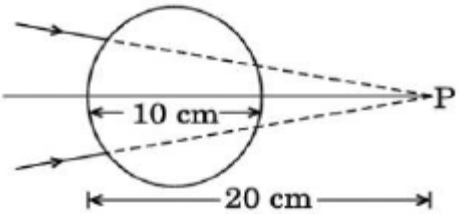
Q6. In the diffraction due to a single slit experiment, the aperture of the slit is 3 mm. If monochromatic light of wavelength 620 nm is incident normally on the slit, calculate the separation between the first order minima and the 3rd order maxima on one side of the screen. The distance between the slit and the screen is 1.5 m.

Q7. Draw a labelled ray diagram of compound microscope, when final image forms at the least distance of distinct vision.

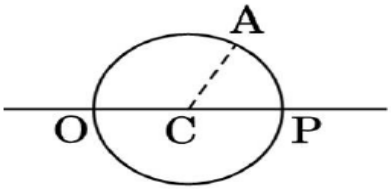
Why is its objective of short focal length and of short aperture, compared to its eyepiece? Explain. The focal length of the objective is 4 cm while that of eyepiece is 10 cm. The object is placed at a distance of 6 cm from the objective lens. (i) Calculate the magnifying power of the compound microscope, if its final image is formed at the near point. (ii) Also calculate length of the compound microscope.

Q8. A convex lens of focal length 20 cm and a concave lens of focal length 15 cm are kept 30 cm apart with their principal axes coincident. When an object is placed 30 cm in front of the convex lens, calculate the position of the final image formed by the combination. Would this result change if the object were placed 30 cm in front of the concave lens? Give reason

Q9. A converging beam of light travelling in air converges at a point P as shown in the figure. When a glass sphere of refractive index 1·5 is introduced in between the path of the beam, calculate the new position of the image. Also draw the ray diagram for the image formed.



Q10. A point 'O' marked on the surface of a glass sphere of diameter 20 cm is viewed through glass from the position directly opposite to the point O. If the refractive index of the glass is 1·5, find the position of the image formed. Also, draw the ray diagram for the formation of the image.



Q11. A ccording to Huygen's construction which of the following wavefront does not exists?

(a) Forward wavewfront (b) Backward wavefront
(c) Cylindrical wavefront (d) Cannot be predicted

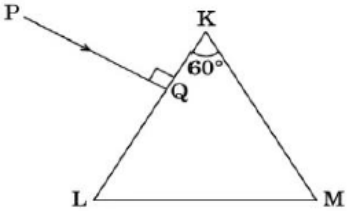
Q12. A planoconvex lens of focal length 16 cm, is to be made of glass of refractive index 1.5. The radius of curvature of the curved surface should be

(a) 8 cm (b) 12 cm (c) 16 cm (d) 24 cm

Q13. In a Young's double-slit experiment the fringe width is 0.2 mm. If the wavelength of light used is incresed by 10% and the separation between the slits is also increased by 10%, then the fringe width will be

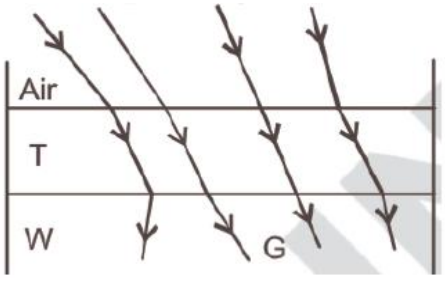
(a) 0.20 mm (b) 0.401 mm (c) 0.242 mm (d) 0.165 mm

Q14. A triangular prism of refracting angle 60° is made of a transparent material of refractive index 3/2. A ray of light is incident normally on the face KL as shown in the figure. Trace the path of the ray as it passes through the prism and calculate the angle of emergence and angle of deviation.



Q15. The optical density of turpentine is Higher than that of water while its mass density is lower. Figure shows a layer of turpentine floating over water in a container. For which one of the four rays incident on turpentine in fig, the path shown is correct?

(a) 1 (b) 2 (c) 3 (d) 4



CHEMISTRY (043)

Q1. The experimental molecular weight of an electrolyte will always be less than its calculated value of Van't Hoff factor, 'I' is:

(a) Greater than 1 (b) Less than 1 (c) One (d) Zero

Q2. If a is the degree of dissociation of K_2SO_4, the van't Hoff factor (i) used for calculating the molecular mass is

(a) $1 - 2\,\alpha$ (b) $1 + 2\,\alpha$ (c) $1 - \alpha$ (d) $1 + \alpha$

Q3. The porous membrane used in reverse osmosis plant is made up by

(a) Cellulose acetate (b) Potassium nitrate

(c) Mercuric iodide (d) Starch

Q4. The number of moles of NaCl in 3 litres of 3 M solution is

(a) 1 (b) 3 (c) 9 (d) 27

Q5. If molality of the dilute solution is doubled, the value of the molal depression constant will be

(a) doubled (b) halved (c) tripled (d) unchanged

Q6. In a lead storage battery, the electrolyte H_2SO_4 solution is

(a) 38% (b) 62% (c) 80% (d) 48%

Q7. The emf produced by a voltage cell is

(a) Electrode potential (b) Reduction potential

(c) Cell potential (d) Oxidation potential

Q8. The cell constant of a conductivity cell

(a) Changes with change in concentration of electrolyte

(b) Changes with the nature of electrolyte

(c) Changes with change in temperature of electrolyte

(d) Remains constant for a cell.

Q9. When initial concentration of reactant is double in a reaction, the half-life period is not affected. The order of reaction is

(a) Second (b) Zero

(c) First (d) More than zero but less than first

Q10. The first order rate constant for the decomposition of N_2O_5 is $6.2 \times 10^{-3}\ sec^{-1}$. The $t_{1/2}$ of the decomposition

(a) 117.7 sec (b) 111.7 sec (c) 228.4 sec (d) 168.9 sec

Q11. Gases tend to be less soluble in liquids as the temperature is raised. Why?

Q12. What is reverse osmosis? Give one large scale use of it.

Q13. What is a semi permeable membrane?

Q14. Under what condition is Van't Hoff factor less than one?

Q15. Why is glycol and water mixture used in car radiators in cold countries?

Q16. Given reason for the following : -

(a) Aquatic species are more comfortable in cold waters than in warm waters.

(b) To avoid bends scuba divers use air diluted with helium.

(c) Cold drinks bottles are sealed under high pressure of CO_2.

Q17. For a dilute solution containing 2.5 g of a non-volatile non-electrolyte solute in 100 g of water, the elevation in boiling point at 1 atm pressure is 2°C. Assuming concentration of solute is much lower than the concentration of solvent, determine the vapour pressure (mm of Hg) of the solution.

Q18. Osmotic pressure of a 0.0103 molar solution of an electrolyte was found to be 0.75 atm at 27°C. Calculate Van't Hoff factor.

Q19. What is meant by cell constant?

Q20. Define the term molar conductivity.

Q21. Which type of cell is lead storage battery? Write its electrode reaction.

Q22. Which type of cell is mercury cell? Write its electrode reaction.

Q23. Calculate the equilibrium constant for the reaction

$Cu(s) + 2Ag^+(aq) \rightarrow Cu^{2+} + 2Ag(s)$ E^0 cell=0.46 V.

Q24. The standard electrode potential for Daniell cell is 1.1 V. Calculate the standard Gibbs energy for the reaction:

$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$

Q25. What do you understand by rate of a reaction?

Q26. Distinguish between order and molecularity of a reaction.

Q27. Rate of a reaction is given by the equation: $Rate = [A]^2[B]$.
What are the units for the rate and rate constant for this reaction?

Q28. Name the factors on which the rate of a particular reaction depends.

Q29. The rate constant for a first order reaction is 60 s^{-1}. How much time will it take to reduce the initial concentration of the reactant to its $1/16^{th}$ value?

Q30. During nuclear explosion, one of the products is ^{90}Sr with half-life of 28.1 years. If 1pg of ^{90}Sr was absorbed in the bones of a newly born baby instead of calcium, how much of it will remain after 10 years and 60 years if it is not lost metabolically.

INVESTIGATORY PROJECT (Any One)

Q1. Study of the presence of oxalate ions in guava fruit at different stages of ripening.

Q2. Study of quantity of casein present in different samples of milk.

Q3. Preparation of soybean milk and its comparison with the natural milk with respect to curd formation, effect of temperature, etc.

Q4. Study of the effect of Potassium Bisulphate as food preservative under various conditions (temperature, concentration, time, etc.)

Q5. Study of digestion of starch by salivary amylase and effect of pH and temperature on it.

Q6. Comparative study of the rate of fermentation of following materials: wheat flour, gram flour, potato juice, carrot juice, etc.

Q7. Extraction of essential oils present in Saunf (aniseed), Ajwain (carum), Illaichi (cardamom).

Q8. Study of common food adulterants in fat, oil, butter, sugar, turmeric power, chilli powder and pepper.

MATHEMATICS (041)

Q1. Show that the relation R in the set of real numbers, defined as R= {(a, b): a≤ b^2}: is neither reflexive not symmetric nor transitive.

Q2. If f(x) = x+7 and g(x)= x-7, find (fog)(7), where x is a real number.

Q3. If R = {(x, y): x+2y=8} is a relation on N, write the range for R.

Q4. Let R= {(a, a^3): a is a prime number less than 5} be a relation. Find the range of R.

Q5. Let S = {x: x is a resident of Delhi}. A relation R on S is defined by R = {(a, b): a and b are members of a joint family}. Check whether R is an equivalence relation?

Q6. Show that the relation R defined by $(a,b)R\ (c,d) \Rightarrow a+d=b+c$ on the set N X N is an equivalence relation.

Q7. Given that $f(x)=\sin x$ check if function f is one-one for (i) $(0,\pi)$ (ii) $\left(-\frac{\pi}{2},\frac{\pi}{2}\right)$.

Q8. If $f: R \to R$ and $g: R \to R$ are defined respectively as $f(x)=x^2+3x+1$ and $g(x)=2x-3$, find fog.

Q9. Consider $f: R-\left\{-\frac{4}{3}\right\} \to R-\left\{\frac{4}{3}\right\}$ given by $f(x)=\frac{4x+3}{3x+4}$. Show that f is bijective. Find the inverse of f and hence find $f^{-1}(0)$ and x such that $f^{-1}(x)=2$.

Q10. Consider $f: R_+ \to [-5,\infty)$ given by $f(x)=9x^2+6x-5$. Show that f is invertible with $f^{-1}(y)=\left(\frac{\sqrt{y+6}-1}{3}\right)$.

Q11. Show that: $\tan\left(\frac{1}{2}\sin^{-1}\frac{3}{4}\right)=\frac{4-\sqrt{7}}{3}$.

Q12. Prove that: $\tan^{-1}\sqrt{x}=\frac{1}{2}\cos^{-1}\left(\frac{1-x}{1+x}\right)$.

Q13. Write the principal value of $\tan^{-1}(\sqrt{3})-\cot^{-1}-(\sqrt{3})$.

Q14. Write the value of $\tan^{-1}\left[2sin\left(2\cos^{-1}\frac{\sqrt{3}}{2}\right)\right]$.

Q15. Find the principal value of $\sec^{-1}\left(sec\left(\frac{-8\pi}{5}\right)\right)$.

Q16. Evaluate: $\sin^{-1}(sin10)$.

Q17. Solve the following for x: $\cos^{-1}\ (sin(\cos^{-1}x))=\frac{\pi}{3}$.

Q18. Draw the graph of the $y=\tan^{-1}x$ where $y \in \left[\frac{-\pi}{2},0\right]$.

Q19. Evaluate the following: $\sin\left(2\sin^{-1}\frac{3}{5}\right)$.

Q20. Write the range of one branch of $\sin^{-1}x$, other than the principal branch.

Q21. Write a square matrix of order 2, which is both symmetric and skew symmetric.

Q22. If $A' = \begin{bmatrix} 3 & 4 \\ -1 & 2 \\ 0 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 1 & 2 & 3 \end{bmatrix}$, then find $A' - B'$.

Q23. Solve the following matrix equation for x: $[x \quad 1]\begin{bmatrix} 1 & 0 \\ -2 & 0 \end{bmatrix} = O$.

Q24. To promote the making of toilets for women, an organization tried to generate awareness through i) House call, ii) letters and iii) announcements.
The cost of each mode per attempt is given below:
(i) Rs.50, (ii) Rs.20, (iii) Rs.40
The number of attempts made in three villages X, Y and Z are given below:

	(i)	(ii)	(iii)
X	400	300	100
Y	300	250	75
Z	500	400	150

Find the total sum incurred by the organization for the three villages separately, using matrices.

Q25. If $A = \begin{bmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{bmatrix}$, then for what value of α is A an identity matrix?

Q26. Find the matrix A such that: $\begin{bmatrix} 2 & -1 \\ 1 & 0 \\ -3 & 4 \end{bmatrix} A = \begin{bmatrix} -1 & -8 \\ 1 & -2 \\ 9 & 22 \end{bmatrix}$.

Q27. Show that A′A and AA′ are both symmetric matrices for any matrix A.

Q28. Express the matrix $\begin{bmatrix} 2 & 3 & 1 \\ 1 & 1 & 2 \\ 4 & 1 & 2 \end{bmatrix}$ as the sum of a symmetric and a skew symmetric matrix.

Q29. If the matrix $\begin{bmatrix} 0 & a & 3 \\ 2 & b & 1 \\ c & 1 & 0 \end{bmatrix}$ is a skew symmetric matrix, find the values of a, b and c.

Q30. If A = $\begin{bmatrix} 1 & 5 \\ 7 & 12 \end{bmatrix}$ and B = $\begin{bmatrix} 9 & 1 \\ 7 & 8 \end{bmatrix}$, find a matrix C such that 3A + 5B + 2C is a null matrix.

BIOLOGY (044)

(I) DO THE FOLLOWING QUESTIONS OF CHAPTER 1, 2, 3, IN BIO COPY

Q1. Can a plant flowering in Mumbai be pollinated by pollen grains of the same species growing in New Delhi? Provide explanation to your answer.

Q2. Why is fertilization in an angiosperm referred to as double fertilization? Mention the ploidy of the cells involved.

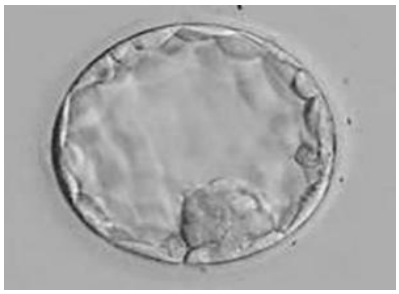
Q3. Name and explain the role of inner and middle walls of human uterus.

Q4. Draw a diagrammatic sectional view of the female reproductive system of human and label the parts.
(a) Where the secondary oocyte develop?
(b) Which help in collection of ovum after ovulation.
(c) Mention the hormones and their functions involved in maturation of ovum.

Q5. A woman has certain queries as listed below, before starting with contraceptive pills. Answer them.
(i) What do contraceptive pills contain and how do they act as contraceptives?
(ii) What schedule should be followed for taking these pills?

Q6. A couple where both husband and wife are producing functional gametes, but the wife is still unable to conceive, is seeking medical aid. Describe any one method that you can suggest to this couple to become happy parents.

Q7. Study the given figure below and answer the questions that follows.



(i) Name the stage of human embryo the figure represents.
(ii) Identify the figure and label the parts.
(iii) Mention the fate of the inner cells after implantation in the uterus.
(iv) Where the stem cells are located this embryo?

Q8. Describe endosperm the development in angiosperm.

Q9. Meiosis is an essential event in the sexual cycle of any organism. Give two reasons.

Q10. What is apomixis? How is it useful to the farmer?

Q11. A flower of tomato plant following the process of sexual reproduction produces 240 viable seeds. Answer the following questions giving reasons:

(a) What is the minimum number of pollen grains that must have been involved in the pollination of its pistil?

(b) What would have been the minimum number of ovules present in the ovary?

(c) How many megaspore mother cells were involved?

Q12. Explain the events after pollination leading to the formation of a seed in angiosperms.

Q13. List any three outbreeding devices that flowering plants have developed and explain how they help to encourage cross-pollination.

Q14. Mature seeds of legumes are non-albuminous. Then, can it be assumed that double fertilisation does not occur in legumes? Explain your answer.

Q15. An anther with malfunctioning tapetum often fails to produce viable male gametophytes. Why?

Q16. What is the effect of high conc. of LH on a mature Graafian follicle?

Q17. How is Placenta formed in the human female? Name the hormones secreted by it and their function.

Q18. How does 'Cu T' act as an effective contraceptive?

Q19. Draw labelled diagrams for the following:

(a) T.S. of Testis.

(b) Sectional view of human ovary.

(c) a fertilized embryo sac of a dicot flower

(d) a typical anatropous ovule

(II) MAKE THE BIOLOGY INVESTIGATORY PROJECT ON THE SELECTED TOPIC OF YOUR INTEREST AND SUBMIT IT AFTER THE SUMMER BREAK.

(III) WRITTEN WORK OF PRACTICAL FILES TO BE COMPLETED.

INFORMATICS PRACTICES (065)

Q1. Write SQL commands for the questions from (i) to (xii) and write output(s) from (xiii) to (xv) based on the following table DEPARTMENT.

AdmNo	Name	Address	Join_Date	Fee	Semester	Grade
1256	Aditya	B-4, Dwarka, Mumbai	2016-07-23	45000	I	A1
5678	Amit	Sec 5, R.K.Puram	2015-06-15	35000	III	B2
1425	Karina	B3/2, V.Vihar, Patna	2013-06-22	26000	II	C1
8954	Bikram	Sec 2, Pune	2012-03-13	75000	I	A2
1789	Vijay	123/a, Mumbai	2014-02-17	35000	II	B1
8376	Ganesh	53/2, Chandigarh	2012-10-05	0	II	C3
2938	Bharath	11/7, Chennai	2012-06-24	25000	II	B2
6498	Tarun	117-n, Delhi	2016-05-25	32000	I	A1
5420	Rajan	56-e, Ahemadabad	2014-02-27	32000	III	B2
8567	Anita	73/c, Faridabad	2012-08-22	38000	I	C2

(i) Display all the details.

(ii) Display Admission Number and Name of the students.

(iii) Display the all the details of C1 grade students.

(iv) Display the Name and Join Date of all the students who have got A1 grades.

(v) Display the Name and Fees of all the students who are studying in Semester I and III.

(vi) Display the details of all students who have paid fees more than Rs.35,000.

(vii) Display the admission no., name and address of all the students who have paid the fees less than Rs.30,000.

(viii) Display the details of students who have paid the fees in the range Rs.30,000 – Rs.40,000 (Both values inclusive).

(ix) Display the name and address of all the students who have paid the fees in the range Rs.25,000 – Rs.35,000 (Both values exclusive).

(x) Display the details of the students whose have not paid any fees.
(xi) Display the details of all scholars whose date of join is before 30/June/2012.
(xii) Display the Name. Fee and Grade of the student with the admission number 1425.
(xiii) SELECT ADMNO, NAME FROM DEPARTMENT WHERE FEES > 40000;
(xiv) SELECT NAME, JOIN_DATE FROM DEPARTMENT WHERE JOIN_DATE >= '2016-01-01';
(xv) xv.SELECT * FROM DEPARTMENT WHERE GRADE IN ('B2', 'C1');

PHYSICAL EDUCATION (048)

Write a Practical manual on Volleyball/ Basketball/ Handball with colored picture in your practical book according to CBSE board External practical 2025-26 (Refer the pdf file which was shared)

- Cover it with Red color paper
- Label it with all the details with pain white stickers (refer previous year practical manual)
- Stick pictures on blank pages only
- Detail index should be there
- Decorate it appropriately (inside)

ARTIFICIAL INTELLIGENCE (843)

Q1. Collect data on 20 applications of artificial intelligence in daily life.
Q2. What is Big Data?
Q3. Describe the advantages and disadvantages of using Big Data.
Q4. What are the 6V's of Big Data, and how do they provide a more holistic view of Big Data?
Q5. What is the role of Hadoop in Big Data processing?
Q6. How does Big Data Analytics work, and what are its key components?
Q7. What tools are commonly used in Big Data analytics, and how do they help?
Q8. What are the different types of spreadsheet?
Q9. What are the different components of a Spreadsheet?
Q10. Define Relative referencing, Mixed referencing and Absolute referencing.
Q11. What do you mean by shorting in Libreoffice?
Q12. How to protect a spreadsheet with password?
Q13. What are the various advanced features used in a digital presentation?
Q14. What are the techniques that are used to manage stress?