
FLORENCE INTERNATIONAL SCHOOL
FLORENCE INTERNATIONAL SCHOOL
(Sr Secondary Affiliated with CBSE)
ISO 21001:2018
SUMMER
HOLIDAY HOMEWORK
Grade - 11

Work Instructions for Project Files

- Prepare a handwritten investigatory project file.
- Use A4-size ruled sheets.
- Attach relevant diagrams, tables, and graphs. Include real observations/photographs (if possible).
- Maintain neatness and proper headings.

PROJECT FILE FORMAT

1. Your project must include the following sections:
Cover Page
Title of project
Student name
Class & Section
Roll number
School name
2. Certificate
3. Acknowledgement
4. Index
5. Introduction: Basic theory of the topic, Importance in daily life
6. Aim
7. Material Required
8. Theory: Scientific explanation with chemical principles
9. Procedure: Step-by-step method
10. Observations
11. Calculations (if applicable)
12. Result
13. Conclusion
14. Precautions
15. Bibliography

IMPORTANT GUIDELINES

- Project must be original (no copy-paste)
- Data should be realistic and logical
- Proper chemical equations wherever required
- Include graphs/charts for analysis
- Viva questions will be based on your project
- Submission must be on time
- Maintain scientific language in science projects

CHEMISTRY

Q 1. Project Files to be prepared on the following topics:

1. **Arnav Kashyap & Ashika Chauhan**: Checking the bacterial contamination in drinking water by testing the sulphide ion
2. **Ayush Mukharjee & Dipanshu:** Study of the methods of purification of water
3. **Ayush Yadav & Khushi:** Testing the hardness, presence of Iron, Fluoride, Chloride, etc., depending upon the regional variation in drinking water and study of causes of presence of these ions above permissible limit (if any).
4. **Lakshya & Palak:** Investigation of the foaming capacity of different washing soaps and the effect of the addition of Sodium carbonate on it
5. **Pushkar & Vipul:** Study the acidity of different samples of tea leaves.
6. **Prateek & Aryan Sharma:** Determination of the rate of evaporation of different liquids
7. **Dhanvi & Misty:** Study the effect of acids and bases on the tensile strength of fibres.
8. **Aaradhya Gautam:** Study of acidity of fruit and vegetable juices.

Q 2. Complete the Following Worksheet in the Chemistry Notebook:

CHEMISTRY WORKSHEET

Section A: Multiple Choice Questions:

Q1. The number of atoms present in 16 g of oxygen gas (O_2) is:

A) 6.022×10^{23}

B) 3.011×10^{23}

C) 1.204×10^{24}

D) 1.806×10^{24}

Q2. Which of the following pairs of gases illustrates the Law of Multiple Proportions?

A) CO and CO_2

B) H_2O and D_2O

C) NaCl and NaBr

D) MgO and $Mg(OH)_2$

Q3. What is the concentration of NO_3^- ions when equal volumes of 0.1 M $AgNO_3$ And 0.1 M NaCl is mixed?

A) 0.1 M

B) 0.2 M

C) 0.05 M

D) 0.25 M

Q4. The dynamic orientation of an orbital in space around the nucleus is defined by which quantum number?

A) Principal quantum number (n)

B) Azimuthal quantum number (l)

C) Magnetic quantum number (m_l)

D) Spin quantum number (m_s)

Q5. Which of the following ions has the maximum number of unpaired electrons?

A) Fe^{2+} (Z=26)

B) Cu^{2+} (Z=29)

C) Cr^{3+} (Z=24)

D) Mn^{2+} (Z=25)

Q6. The total number of nodes (radial + angular) for a 4d orbital is:

A) 1

B) 2

C) 3

D) 4

Q7. According to Bohr's theory, the angular momentum of an electron in the 4th orbit is:

A) h/π

B) $2h/\pi$

C) $h/2\pi$

D) $4h/\pi$

Q8. Express the number 0.0000423 in scientific notation with three significant figures:

A) 42.3×10^{-6}

B) 4.23×10^{-5}

C) 4.23×10^{5}

D) 0.423×10^{-4}

Section B: Assertion-Reason Questions:

Directions: Choose the correct option:

A) Both A and R are true, and R is the correct explanation of A.

B) Both A and R are true, but R is not the correct explanation of A.

C) A is true, but R is false.

D) A is false, but R is true.

Q9. Assertion (A): The molality of a solution does not change with a temperature change.

Reason (R): Molality is expressed as the number of moles of solute per kilogram of solvent, and mass is independent of temperature.

Q10. Assertion (A): The electronic configuration of Copper (Z=29) is $[Ar]3d^{10}\ 4s^1$ and not $[Ar]3d^9\ 4s^2$.

Reason (R): Filled d-subshells (d^{10}) provide extra stability due to symmetry and higher exchange energy.

Section C: Short Answer Type-I Questions:

Q11. Calculate the mass of CO_2 produced when 3 g of Carbon is completely burned in 16 g of oxygen gas. Identify the limiting reagent if any.

Q12. A solution is prepared by dissolving 4 g of NaOH in enough water to form 250 mL of the solution. Calculate its molarity. (Molar mass of NaOH=40 g/mol)

Q13. State Heisenberg's Uncertainty Principle. Write its mathematical equation.

Q14. Calculate the wavelength of a ball of mass 0.1 kg moving with a velocity of 10 m s^{-1}. ($h=6.626\times10^{-34}$ J s)

Q15. State the Aufbau Principle. Arrange the following subshells in increasing order of energy: 3d,4s,4p,5s.

Q16. Differentiate between a continuous spectrum and a line emission spectrum.

Section D: Short Answer Type-II Questions:

Q17. A compound on analysis gave the following percentage composition: Na=29.11%, S=40.51%, and O=30.38%. Calculate the empirical formula of the compound. (Atomic masses: Na=23,S=32,O=16)

Q18. (i) Define the term Mole Fraction.

(ii) If a mixture contains 2 moles of substance A and 3 moles of substance B, calculate the mole fraction of both components.

Q19. What are the limitations of Bohr's atomic model? (State any three points).

Q20. (i) Write down the electronic configuration of Cr^{3+} (Z=24).

(ii) Using quantum numbers, explain why a 2d orbital is impossible.

Q21. Calculate the kinetic energy of an electron ejected from a metal surface when radiation of frequency 1.0×10 15 s $^{-1}$ hits the metal. The threshold frequency (v^0) of the metal is 7.0×1014 s^{-1}.

Q22. Define Hund's Rule of Maximum Multiplicity. Show how electrons are distributed in the p-orbital of a Nitrogen atom (Z=7) according to this rule.

Section E: Case-Based Question:

Q23. Case Study: Photoelectric Effect

When light of a certain minimum frequency strikes the surface of a metal, electrons are ejected instantly. This phenomenon is called the Photoelectric Effect. Albert Einstein explained it using Planck's Quantum Theory, stating that light behaves like a stream of energy packets called photons. The kinetic energy of the ejected electron depends linearly on the frequency of the incident radiation, while the number of electrons ejected depends upon the intensity of the light.

1. What is the term given to the minimum energy required to eject an electron from a metal surface?

2. If the frequency of incident light is doubled (keeping it above threshold frequency), what happens to the maximum kinetic energy of the ejected electrons?

3. Calculate the energy of one mole of photons of radiation whose frequency is 5×10^{14} Hz. ($h=6.626\times10^{-34}$ J s, NA $=6.022\times10^{23}$ mol^{-1})

Section F: Long Answer Type Questions:

Q24.(a) Calcium carbonate reacts with aqueous HCl according to the reaction:

$$CaCO_3(s) + 2HCl\ (aq) \rightarrow CaCl_2(aq) + CO2(g) + H_2O(l)$$

What mass of $CaCO_3$ is required to react completely with 25 mL of 0.75 M HCl?

(b) Define and explain the Law of Definite Proportions with an example.

Q25. (a) What are quantum numbers? Briefly explain the significance of the Azimuthal (l) and Magnetic (ml) quantum numbers.

(b) (i) Find the total number of electrons in an atom that can have quantum numbers n=3 and $m_s = -1/2$.

(ii) How many radial nodes are present in a 5s orbital?

Maths

Q 1. Project Files to be prepared on the following topics:

1. **Ayush Yadav - Sets** (Introduction and definition of sets, History/discovery of sets and contribution of mathematicians, Types of sets (empty, finite, infinite, equal, equivalent, universal etc.), Representation of sets (roster form, set-builder form), Operations on sets with formulas and examples, Venn diagrams, Laws of sets and identities, Real life applications of sets, solved examples, Interesting facts and conclusion)
2. **Ayush Mukherjee - Relation and function** (Introduction and definition, Cartesian product, meaning of relation and types of relations, Meaning of function and types of functions (one-one, onto, many-one etc.), Domain, range

and codomain, Mapping diagrams, Graphs of functions, Important formulas/rules, Real life applications, Examples and conclusion)

3. **Prateek - Trigonometric functions** (Introduction to trigonometry and history, Trigonometric ratios and formulas, Degree and radian measure, Unit circle with diagram, Signs in different quadrants, Graphs of sin x, cos x, tan x etc., Trigonometric identities, Important values table, Applications in daily life (height-distance, engineering etc.), Examples and conclusion)
4. **Janya - Complex numbers** Introduction and need of complex numbers, History/discovery, Definition of iota, Standard form a+ib, Real and imaginary parts, Operations on complex numbers, Conjugate and modulus, Argand plane with diagram, Properties and formulas, Applications with examples and conclusion)
5. **Aashika - Inequalities** (Introduction and meaning of inequalities, Types of inequalities, Rules for solving inequalities, Linear and quadratic inequalities, Interval notation, Number line representation with diagrams, Graphical representation, Important formulas/rules, Real life applications, Solved examples and conclusion)
6. **Dhanvi - Complex numbers** (Introduction and need of complex numbers, History/discovery, Definition of iota, Standard form a+ib, Real and imaginary parts, Operations on complex numbers, Conjugate and modulus, Argand plane with diagram, Properties and formulas, Applications with examples and conclusion)
7. **Lakshay - Trigonometric functions** (Introduction to trigonometry and history, Trigonometric ratios and formulas, Degree and radian measure, Unit circle with diagram, Signs in different quadrants, Graphs of sin x, cos x, tan x etc., Trigonometric identities, Important values table, Applications in daily life (height-distance, engineering etc.), Examples and conclusion)
8. **Aryan - Sets** (Introduction and definition of sets, History/discovery of sets and contribution of mathematicians, Types of sets (empty, finite, infinite, equal, equivalent, universal etc.), Representation of sets (roster form, set-builder form), Operations on sets with formulas and examples, Venn diagrams, Laws of sets and identities, Real life applications of sets, Solved examples, Interesting facts and conclusion)
9. **Ishant - Inequalities** (Introduction and meaning of inequalities, Types of inequalities, Rules for solving inequalities, Linear and quadratic inequalities, Interval notation, Number line representation with diagrams, Graphical representation, Important formulas/rules, Real life applications, Solved examples and conclusion)

And write contributions of any 4 Indian Mathematicians in the mathematics field with their photos. (For all students in the same practical file)

Q.2. Make a colourful chart of all Trigonometric identities.

Q.3. Do lab manual activities 1 to 10 with proper diagrams.

Q.4 Complete the following worksheet in the mathematics notebook.

Maths Worksheet

Section A (MCQs)

1. Let A and B be two sets containing four and two elements, respectively. Then the number of subsets of A×B,

   (A) 256 (B) 219 (C) 510 (D) 275

2. The set A = {x : x is a positive prime number less than 10} in tabular form

   (A) {2,3,5,7} (B) {1,2,3,5,7} (C) (3,5,7} (D) {1,3,5,7,9}

3. (1+i/1-i)^x then the value of x (where n is a natural no.) is

   (A) 4n (B) 2n (C) 2n+1 (D) 4n+1

4. Cosec(-1110)=

   (A) -2 (B) 2 (C) 2/√3 (D)-2/√3

5. (sin3x-sinx)/(cosx-cos3x) is equal to

   (A) cot 2x (B) -cot 2x (C) -tan 2x (D) tan 2x

6. If $i + i^2 + i^3 + \ldots\ldots\ldots\ldots i^{2024}$ =a+ib, then a+2b =

   (A) 1 (B) 0 (C) 3 (D) 2

7. If $-3x+27 \geq 2+3x$, then $x \in$

   $(A)\ (-\infty,0)$ $(B)\ (0,\infty)$ $(C\ )\ [0.\infty)$ $(D)(-\infty,25/6]$

8. The set of all prime numbers is

   (A) an infinite set (B), a singleton set (C), a multi-set (D), a finite set

9. If A = {1,2,3,4,5,6} then the number of proper subsets is

   (A) 63 (B) 36 (C) 64 (D) 25

10. The value of $\sin 78° - \sin 66° - \sin 66° + \sin 60°$ is

    (A)1/2 (B) -1 (C) -1/2 (D) none of these

In the question, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option :

(a)Both assertion (A) and reason (R) are true, and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true, and reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true, but reason (R) is false

(d)Assertion (A) is false, and reason (R) is true

11. Assertion (A) - Let A = {a,b} and B = {a,b,c}, then A does not belong to B.

    Reason (R) - If A ⊆ B, then A ∪ B = B

12. Assertion (A) - If a < b, c < 0, then ac > bc.

    Reason (R) - If both sides are multiplied by the same negative, then inequality is reversed.

SECTION - B (Very Short Type Questions)

13. Find the value of sin(−11π/3)
14. Express (5+↓2i)/(1−↓2i) in the form of (a+ib).
15. A function f is defined by f(x) = 2x−5. Write down the values of (i) f(7) (ii) f(-3)
16. Verify De Morgan's Law for: U={1,2,3,4,5}, A={1,2}, B={2,3}
17. If n(A)=20, n(B)=15, and n(A∩B)=5, find n(A∪B).
18. Define: (i) Equal sets (ii) Equivalent sets

SECTION - C (Short Type Questions)

19. If A=2x:xϵN and 1≤x<4, B=x+2:xϵN and 2≤x<5 & C={x:xϵN and 4<x<8}, find
    (a)A – B (b) (A∪B)∩C

20. Show that tan3xtan2xtanx=tan3x−tan2x−tanx

21. cos6x=32cos^6x−48cos^4x+18cos^2x−1
22. Find all the other trigonometric values if tanx=−5/12 where x lies in the 2nd quadrant.
23. Find the modulus of $(1+i)/(1-i)-(1-i)/1+i$.
24. Solve: 2sin^2x−3sinx+1=0

SECTION - D (Long Answer Type Question)

25. Prove that : (cos4x+cos3x+cos2x)/(sin4x+sin3x+sin2x)=cot3x
26. Prove that: tan4x= 4tanx(1−tan^2x)/(1−6tan^2x+tan^4x)
27. In a class of 40 students, 25 students like Mathematics and 18 like science. If 10 students like both subjects, find:
    (i) Number of students who like only Mathematics
    (ii) Number of students who like only Science
    (iii) Number of students who like neither subject
28. Prove that: (1−sinA)/ CosA = CosA/(1+SinA)

SECTION - E (Case Study Type Question)

29. Aditya's mother gave him Rs. 200 to buy some packets of rice and Maggie from the market. The cost of one packet of rice is Rs. 30 and that of one packet of Maggie is Rs. 20. Let x denote the number of packets of rice and y denotes the number of packets of maggie.

(a) Find the inequality that represents the given situation.
(b) If he buys 4 packets of rice and spends the entire amount of Rs. 200, then find the maximum number of packets of maggie that he can buy.
(c) Solve the following inequality for real x: $4x + 3 < 5x + 7$

30. In a school, 60 students play Cricket, 45 play Football, and 25 play both games. Answer the following:
    (a) How many students play at least one game?
    (b) How many students play only Cricket?
    (c) How many students play only Football?
    (d) Draw a Venn diagram for the above information.

Biology

Q 1. Project Files to be prepared on the following topics:

1. **Vipul and Puskar -** Haemodialysis
2. **Arnav -** Nervous system
3. **Khushi and Palak**- Mitosis
4. **Dipanshu and Aradhya** - DNA model

Q2. Complete the Following Worksheet in the biology notebook.

Biology Worksheet

Chapters 1–4: The Living World, Biological Classification, Plant Kingdom & Animal Kingdom

Section A –
Multiple Choice Questions
1. The scientific naming of organisms is called:
a) Identification
b) Classification
c) Nomenclature
d) Morphology
2. The five-kingdom classification was proposed by:
a) Linnaeus
b) Darwin
c) Whittaker
d) Aristotle
3. Which kingdom includes prokaryotic organisms?

a) Fungi
b) Protista
c) Monera
d) Plantae
4. Which group is called the amphibians of the plant kingdom?
a) Bryophytes
b) Gymnosperms
c) Pteridophytes
d) Algae
5. Seeds are enclosed inside fruits in:
a) Gymnosperms
b) Angiosperms
c) Bryophytes
d) Pteridophytes
6. Which phylum has stinging cells called cnidoblasts?
a) Arthropoda
b) Mollusca
c) Cnidaria
d) Chordata
7. Presence of notochord is characteristic of:
a) Porifera
b) Mollusca
c) Chordata
d) Annelida
8. Jointed appendages are present in:
a) Arthropoda
b) Platyhelminthes
c) Cnidaria
d) Porifera
9. Assertion: Earthworms belong to the phylum Annelida.
Reason: Their body shows metameric segmentation.
10. Assertion: Algae are simple thalloid plants.
Reason: Their plant body is not differentiated into root, stem, and leaves.

Section B–

Very Short Answer Questions

1. Define taxonomy. What is binomial nomenclature? Give one example.
2. Mention any two differences between Monera and Protista.
3. Write two characteristics of Bryophytes.
4. Name any two characteristics of Chordata.

Section C –

Short Answer Questions

1. Explain the hierarchy of taxonomic categories.
2. Differentiate between Gymnosperms and Angiosperms.
3. Explain any three characteristics of fungi.
4. Describe three features of Arthropoda with examples.

Section D-

Case Study

1.

A biology teacher showed students different organisms: a sponge, a hydra, an earthworm, a cockroach, and a starfish. Students were asked to classify them based on body organization and symmetry.
Answer the following questions:
i)Which organism belongs to phylum Porifera?
a) Hydra
b) Sponge
c) Starfish
d) Earthworm
ii)Which animal shows radial symmetry?
iii)Name the phylum of earthworms.
iv)What type of body cavity is present in annelids?
2) During a field trip, students observed algae growing in ponds, mosses on moist walls, ferns in shady areas, and mango trees in the school garden. Their teacher explained that plants are classified into different groups according to body organization, vascular tissues, and seed formation.
Answer the following questions:
i)Algae belong to:
a) Bryophytes
b) Pteridophytes
c) Thallophytes
d) Gymnosperms
ii)Which group is called the "amphibians of the plant kingdom"?
a) Algae
b) Bryophytes
c) Angiosperms
d) Gymnosperms
iii)Name the first terrestrial plants with vascular tissues.
iv)Which among the observed plants produce seeds enclosed within fruits?

Section E–
Long Answer Questions
1. Explain Whittaker's Five Kingdom Classification with suitable criteria.
2. Draw and explain a chart of the Plant Kingdom classification.
3. Differentiate between vertebrates and invertebrates with examples.

PHYSICS

Q 1. Project Files to be prepared on the following topics:

1. **Palak and Khushi -** Study of laws of motion

2. **Vipul and Lakshay -** Study of friction force and its laws
3. **Ayush and Pushkar -** Variation of acceleration of gravity
4. **Prateek and Aryan -** Circular motion
5. **Dhanvi and Mishthi -** Banking of roads
6. **Ashika and Aradhya -**Study of different kinds of pendulums
7. **Arnav and Ayush Mukharji -** Elasticity of different materials
8. **Dipanshu and Drona-** Viscosity of different kinds of liquids, and explain your findings

Questions 2.
Do all questions in loose sheets

	Section A	
1	If 3.8×10^{-6} is added to 4.2×10^{-5} giving due regard to significant figures, then the result will be a) 4.6×10^{-5} b) 45×10^{-5} c) 35×10^{-5} d) 4.58×10^{-5}	
2	The number of significant figures in 0.06900 is a) 4 b) 3 c) 2 d) 5	
3	According to Newton, the viscous force acting between liquid layers of area A and velocity gradient $\frac{\Delta v}{\Delta x}$ is given by $F=-\eta A\frac{\Delta v}{\Delta x}$, where η is constant called coefficient of viscosity. The dimensional formula of η is a) $[\,ML^{-2}T^{-2}\,]$	

	b) [$ML^{-1} T^{-1}$] c) [$M^0 L^0 T^0$] d) [$ML^2 T^{-2}$]	
4	In the relation, y = r sin (ω t + kx), the dimensional formula for kx or ω t is same as: a) $\frac{r}{\omega}$ b) $\frac{yr}{\omega t}$ c) $\frac{\omega t}{r}$ d) $\frac{r}{y}$	
5	If momentum (P), area (A) and time (T) are taken to be fundamental quantities, then energy has the dimensional formula. a) ($P^1 A^{-1/2} T^1$) b) ($P^2 A^1 T^1$) c) ($P^1 A^{1/2} T^{-1}$) d) ($P^1 A^{-1} T^1$)	
6	The quantity having the same unit in all system of unit is a) length b) mass c) temperature d) time	
7	The number of significant digits in 48,923 is a) 3	

	b) 4 c) 2 d) 5	
8	An equation is given here, $\left(P + \frac{a}{V^2}\right) = b\frac{\theta}{V}$, where P = pressure, V = volume and θ = absolute temperature. If a and b are constants, the dimensions of a will be a) [$ML^{-5} T^{-1}$] b) [$ML^{5} T^{-2}$] c) [$ML^{5} T^{1}$] d) [$M^{-1} L^{5} T^{2}$]	
9	Which of the following has the dimensions of pressure? a) [MLT^{-2}] b) [$ML^{-1} T^{-2}$] c) [$ML^{-2} T^{-2}$] d) [$M^{-1} L^{-1}$]	
10	If the energy (E), velocity (v) and force (F) be taken as fundamental quantity, then the dimensions of mass will be: a) Fv^{-2} b) Ev^{-2} c) Fv^{-1} d) Ev^{2}	
11	are dimensions of: a) power	

	b) momentum c) moment of force d) force	
12	In SI system the fundamental units are a) meter, kilogram, second, coulomb, Kelvin, mole, candela and horse power b) meter, kilogram, second, ampere, Kelvin, mole and candela c) meter, kilogram, second, ampere, Kelvin, mole and watt d) meter, Newton, second, ampere, Kelvin, mole and candela	
13	If L = 2.331 cm, B = 2.1 cm, then L + B = ? a) 4.43 cm b) 4 cm c) 4.431 cm d) 4.4 cm	
14	Dimensions [$ML^{-1} T^{-1}$] are related to a) coefficient of viscosity b) work c) torque d) energy	
15	Dimensions of bulk modulus are: a) [$M^2 L^2 T^{-1}$]	

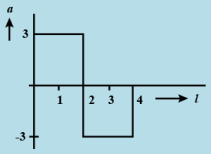
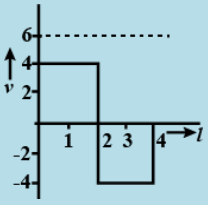
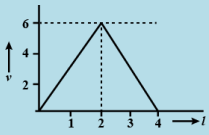
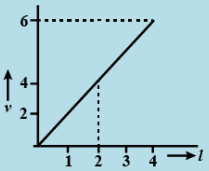
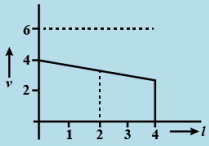
	b) [$ML^{-2} T^{-2}$] c) [$M^{-1} LT^{-2}$] d) [$ML^{-1} T^{-2}$]	
16	**Assertion (A):** Force cannot be added with power. **Reason (R):** The dimensions of force and pressure are different. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
17	**Assertion (A):** Dimensional constants are the quantities whose value are constant. **Reason (R):** Dimensional constants are dimensionless. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true, but R is not the correct explanation of A.	

	c) A is true, but R is false. d) A is false, but R is true.	
18	**Assertion (A):** Impulse has the dimensions of momentum. **Reason (R):** Impulse is directly proportional to force and time. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
19	**Assertion (A):** In the expression $F = 6\pi rv\eta$, the dimensions of η are $ML^{-1}T^{-1}$. **Reason (R):** The coefficient of viscosity and linear momentum have the same dimensions. a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true, but R is not the correct explanation of A.	

	c) A is true, but R is false. d) A is false but R is true.	
20	**Assertion (A):** The equation y = x + t cannot be true, where x and y are distance and t is time. **Reason (R):** Quantities with different dimensions cannot be added. a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true, but R is not the correct explanation of A. c) A is true, but R is false. d) A is false, but R is true.	
21	A jet lands on an aircraft carrier at 30 m/s. What is its acceleration if it stops in 2.0 s? a) $20ms^{-2}$ b) - $10ms^{-2}$ c) - $20ms^{-2}$ d) - $15ms^{-2}$	
22	A body falling from rest describes distances s_1 , s_2 and s_3 in the first, second, and third	

	seconds of its fall, then the ratios $_1$: s $_2$: s $_3$ is: a) 1 : 4: 9 b) 1 : 3: 5 c) 1: 1: 1 d) 1 : 2: 3	
23	Instantaneous velocity or simply velocity v at an instant t equal a) $\lim_{t\to 0} \frac{\Delta x}{\Delta t}$ b) $\lim_{t\to 0} \frac{\Delta x}{2\Delta t}$ c) $\lim_{t\to 1} \frac{\Delta x}{\Delta t}$ d) $\lim_{t\to \infty} \frac{\Delta x}{\Delta t}$	
24	A 100 m long train is moving with a uniform velocity of 45 km/h. The time taken by the train to cross a bridge of length 1 km is: a) 88 s b) 58 s c) 78 s d) 68 s	
25	A ball is dropped from top of a tower of 100 m height. Simultaneously another ball was thrown upward from the bottom of the tower with a speed of 50 m/s. They will cross each other (g = 10 m/s^2) after a) 3sec	

	b) 4sec c) 2sec d) 1 sec	
26	A truck covers 40.0 m in 8.50 s while smoothly slowing down to a final speed of 2.80 m/s. Find its original speed in m/s: a) 7.61 b) 6.61 c) 5.61 d) 8.61	
27	A particle moves along a straight-line OX. At a time t(in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest? a) 40 m b) 24 m c) 56 m d) 16 m	
28	A golf ball is released from rest from the top of a very tall building. Calculate the position in m of the ball after 2.00 seconds. a) 22.2 b) 19.6 c) 32.1 d) 20.9	

29	A particle starts from rest at t = 0 and undergoes an acceleration **a** in ms $^{-2}$ with time **t** in seconds, which is as shown here:  Which one of the following plots represents velocity v in ms $^{-1}$ verses time t in seconds?  a)  b)  c)  d)	
30	If a ball is thrown vertically upwards with speed u, the distance covered during the last seconds of its ascent is: a) $\frac{1}{2}gt^2$ b) (u +gt)t	

	c) ut d) ut - $\frac{1}{2}gt^2$	
31	A rubber ball is dropped from a height of 5 m on a plane. On bouncing, it rises to 1.8 m. The ball loses its velocity on bouncing by a factor of: a) $\frac{3}{5}$ b) $\frac{16}{25}$ c) $\frac{2}{5}$ d) $\frac{9}{25}$	
32	Motion of a particle is given by equations s = $(3t^3 + 7t^3 + 14t + 8)$m. The value of acceleration of the particle at t = 1 sec is: a) 32 m/s^2 b) 10 m/s^2 c) 23m/s^2 d) 16 m/s^2	
33	A ball thrown upward from the top of a tower with speed v reaches the ground in t_1 second. If this ball is thrown downward from the top of the same tower with speed v, it reaches the ground in t_2 seconds. In what time will the ball reach the ground if it is allowed to fall freely	

	under gravity from the top of the tower? a) $\sqrt{t_1 t_2}$ b) $t_1 + t_2$ c) $\frac{t_1 - t_2}{2}$ d) $\frac{t_1 + t_2}{2}$	
34	A car is moving along a straight road with a uniform acceleration. It passes through two points, P and Q, separated by a distance, with velocities of 30 km/h and 40 km/h, respectively. The velocity of the car midway between P and Q is: a) 35 Km/h b) $20\sqrt{2}$ Km/h c) $25\sqrt{2}$ Km/h d) 33.3 Km/h	
35	A particle of unit mass undergoes one - dimensional motion such that its velocity varies according to $v(x) = \beta x^{-2n}$ where β and n are constants and x is the position of the particle. The acceleration of the particle as a function of x, is given by a) - $2n\beta^2 x^{-4n+1}$ b) - $2\beta^2 x^{-2n+1}$ c) - $2n\beta^2 x^{-2n-1}$	

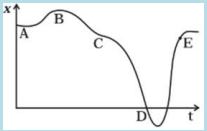
	d) - $2n\beta^{2}$ x $^{-4n-1}$	
36	**Assertion:** An object can have constant speed but variable velocity. **Reason:** Speed is a scalar, but velocity is a vector physical quantity. a) If both assertion and reason are true and the reason is the correct explanation of the assertion. b) If both assertion and reason are true, but the reason is not the correct explanation of the assertion. c) If the assertion is true but the reason is false. d) If both assertion and reason are false.	
37	**Assertion (A):** The position - time graph of a uniform motion in one dimension of a body can have a negative slope. **Reason (R):** When the speed of the body decreases with time, the position - time graph of the moving body has a negative slope. a) Both A and R are true and R is the correct explanation of A.	

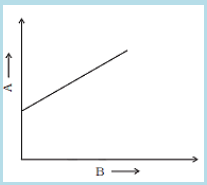
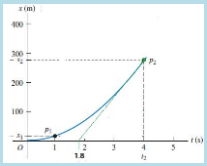
	b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
38	**Assertion (A):** A body may be accelerated even when it is moving at a uniform speed. **Reason (R):** When the direction of motion of the body is changing, then the body may have acceleration. a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true, but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
39	**Assertion (A):** The slope of the displacement - time graph of a body moving with high velocity is steeper than the slope of the displacement - time graph of a body with low velocity. **Reason (R):** Slope of displacement - time	

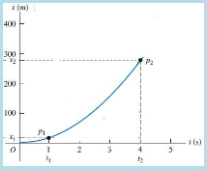
	graph = Velocity of the body. a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true, but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
40	**Assertion (A):** A particle thrown upward has zero velocity at its uppermost point. **Reason (R):** The zero velocity of a particle at any instant implies that the acceleration of the particle is also zero at that instant. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
41	**Assertion:** An object may have varying	

	speed without having varying velocity. **Reason:** For an object, if velocity is zero at an instant, acceleration should also be zero at that instant. a) If both assertion and reason are true and the reason is the correct explanation of the assertion. b) If both assertion and reason are true, but the reason is not the correct explanation of the assertion. c) If the assertion is true but the reason is false. d) If both assertion and reason are false.	
42	**Assertion (A):** In a realistic situationthe x - t, and a - t graphs will be smooth. This means physically that acceleration and velocity cannot change values abruptly at an instant. **Reason (R):** Changes are always continuous. a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A.	

	c) A is true but R is false. d) A is false but R is true.	
43	**Assertion:** A body may have velocity even if its acceleration is zero. **Reason:** Acceleration of a body is the rate of change of velocity of the body. a) If both assertion and reason are true and the reason is the correct explanation of the assertion. b) If both assertion and reason are true but the reason is not the correct explanation of the assertion. c) If the assertion is true but the reason is false. d) If both assertion and reason are false.	
44	**Assertion (A):** A body falling freely may do so with constant velocity. **Reason (R):** The body falls freely when the acceleration of a body is equal to the acceleration due to gravity. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the	

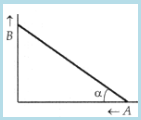
	correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
45	**Assertion (A):** Acceleration may decrease while the velocity increases. **Reason (R):** Acceleration is the change of velocity with respect to time. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
46	A graph of x versus t is shown in Fig. Choose the correct alternatives from below.  a) The particle was released from rest at t = 0. b) The speed at D exceeds that at E.	

	c) At C, the velocity and the acceleration vanish. d) Average velocity for the motion between A and D is positive.	
47	The variation of quantity A with quantity B, plotted in Fig., describes the motion of a particle in a straight line.  a) Quantity A is velocity if motion is uniformly accelerated. b) Quantity B may represent time. c) Quantity A is displacement if motion is uniform. d) Quantity A is velocity if motion is uniform.	
48	With reference to the figure below, which shows a particle moving along a straight line, the y - axis represents the position and the x-axis represents time. Ifx_2 = 270m, the instantaneous velocity at x_2 in m/s is 	

	a) 138 b) 123.0 c) 145 d) 130	
49	With reference to the figure, which shows a particle moving along a straight line, the y-axis represents the position, and the x-axis represents time. If x_1 = 18m, the average velocity at x_1 in m/s is  a) 180 b) 1.8 c) 18.0 d) 20	
50	Multiplying a vector $\vec{v}$ by a negative real number λ a) gives a vector $\overrightarrow{v'} = \lambda\vec{v}$ in a direction opposite to $\vec{v}$ b) gives a scalar that is λ times the polar angle of $\vec{v}$ c) gives a vector $\overrightarrow{v'} = \lambda\vec{v}$ in the same direction as $\vec{v}$ d) gives a scalar that is λ times the magnitude of $\vec{v}$	

51	**Assertion (A):** Multiplying any vector by any scalar is a meaningful operation. **Reason (R):** In uniform motion, speed remains constant. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
52	We can define the difference of two vectors A and B as the sum of two vectors A and B,' such that B' is equal to B multiplied by a) 0 b) - 2 c) - 1 d) 1	
53	The vector sum of two forces is perpendicular to their vector differences. In that case, the forces a) are equal to each other b) are equal to each other in magnitude	

	c) are not equal to each other in magnitude d) cannot be predicted	
54	An arbitrary vector $\vec{v}$ can be expressed as a sum of three mutually perpendicular unit vectors, each multiplied by a a) scalar constant equal to 1 b) some scalar constant c) scalar constant equal to - 1 d) same scalar constant	
55	**Assertion (A):** The projection of $(3\hat{\imath} - 4\hat{k})$ On the y - axis is 3 units. **Reason (R):** The projection of $\vec{A}$ along the y-axis is $\vec{A} \cdot \hat{\jmath}$. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
56	Two particles A and B are connected by a rigid rod AB. The rod slides along	

	perpendicular rails as shown here.  The velocity of A to the left is 10 m/s. What is the velocity of B when angle α = 60°? a) 5.8 m/s b) 9.8 m/s c) 10 m/s d) 17.3 m/s	
57	A unit vector is a vector having a magnitude of 1 and points in a) any chosen direction b) x - direction c) z - direction d) y - direction	
58	If a unit vector is represented by $0.5\hat{\imath} + 0.8\hat{\jmath} + c\hat{k}$, then the value of c is a) 1 b) $\sqrt{0.01}$ c) $\sqrt{0.11}$ d) $\sqrt{0.8}$	
59	If the angle between the vectors $\vec{A}$ and $\vec{B}$ is θ , the value of the product $\left(\vec{B} \times \vec{A}\right) \cdot \vec{A}$ is equal to a) $BA^2 \cos\theta$	

	b) zero c) $BA^2 \sin\theta \cos\theta$ d) $BA^2 \sin\theta$	
60	$\vec{A}$ and $\vec{B}$ are two vectors and θ is the angle between them, if $\left\|\vec{A}\times\vec{B}\right\| = \sqrt{3}\left(\vec{A}\cdot\vec{B}\right)$, the value of θ is a) 45° b) 90° c) 30° d) 60°	
61	If vector$\vec{A} = cos\omega t\hat{\imath} + sin\omega t\hat{\jmath}$ and $\vec{B} = cos\frac{\omega t}{2}\hat{\imath} + sin\frac{\omega t}{2}\hat{\jmath}$ are functions of time, then the value of t for which they are orthogonal to each other is a) $t = \frac{\pi}{2\omega}$ b) $t = \frac{\pi}{\omega}$ c) t = 0 d) $t = \frac{\pi}{4\omega}$	
62	The scalar product of two vectors A and B in terms of the magnitudes and angleθ is a) $\left\| {\bf{A}} \right\|\left\| {\bf{B}} \right\|{\mathrm{tan}} \theta$ b) $\left\| {\bf{A}} \right\|\left\| {\bf{B}} \right\|$	

	\right|{\mathrm{cos}} \theta$ c) $\left\| {\bf{A}} \right\|\left\| {\bf{B}} \right\|{\mathrm{cot}} \theta$ d) $\left\| {\bf{A}} \right\|\left\| {\bf{B}} \right\|{\mathrm{sin}} \theta$	
63	The scalar product of two vectors A and B is a) vector b) a complex number c) a scalar d) a tensor	
64	**Assertion (A):** If $\vec{A} \cdot \vec{B} = \vec{B} \cdot \vec{C}$, then $\vec{A}$ may not always be equal to $\vec{C}$. **Reason (R):** The dot product of two vectors involves cosine of the angle between the two vectors. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
65	**Assertion (A):** The scalar product of two vectors will be zero if	

	the angle between them is 180 ^{o} . **Reason (R):** The scalar product of two vectors $\vec{A}$ and $\vec{B}$ is given by $\vec{A} \cdot \vec{B}$ = AB cos θ . a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
66	**Assertion (A):** If $\vec{A} + \vec{B} + \vec{C}$ = 0 then $\vec{A} \times \vec{B} = \vec{B} \times \vec{C} = \vec{C} \times \vec{A}$. **Reason (R):** The vector sum of three vectors can never be zero. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	

67	**Assertion (A):** If $\vec{A} \times \vec{B} = \vec{A} \times \vec{C}$, then $\vec{C}$ need not be equal to $\vec{B}$. **Reason (R):** The cross product of two vectors depends upon the angle between them. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
68	**Assertion (A):** Angle between two vectors $\hat{j} + \hat{k}$ and $\hat{j}$ is 45°. **Reason (R):** Vector $\hat{j} + \hat{k}$ is equally inclined to both Y and Z axes, and theangle between $\hat{j}$ and $\hat{k}$ is 90°. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	

69	Vector addition is a) intransitive b) commutative c) non - commutative d) asymmetric	
70	Two vectors are given by $\vec{A} = (3\hat{\imath} + \hat{\jmath} + 3\hat{k})$ and $\vec{B} = (3\hat{\imath} + 5\hat{\jmath} - 2\hat{k})$. Find the third vector $\vec{C}$ if $\vec{A} + 3\vec{B} - \vec{C} = 0$ a) $(15\hat{\imath} + 13\,\hat{\jmath} + 4\,\hat{k})$ b) $(12\hat{\imath} + 16\,\hat{\jmath} - 3\,\hat{k})$ c) $(13\hat{\imath} + 17\,\hat{\jmath} + 12\,\hat{k})$ d) $(12\hat{\imath} + 14\,\hat{\jmath} + 12\,\hat{k})$	
71	The square of the resultant of two equal forces is three times their product. The angle between the forces is a) $\frac{\pi}{3}$ b) $\frac{\pi}{2}$ c) $\frac{\pi}{4}$ d) π	
72	To find the sum of vectors $\vec{A}$ and $\vec{B}$, we place a vector $\vec{B}$ so that it's a) direction is the same as that of the vector $\vec{A}$ b) tail is at the head of the vector $\vec{A}$	

	c) tail is at the tail of the vector $\vec{A}$ d) head is at the head of the vector $\vec{A}$	
73	Vectors are added by a) adding the angles of the vectors b) adding the magnitudes of the vectors c) translating the two vectors d) parallelogram law of addition	
74	**Assertion (A):** If the sum of the two unit vectors is also a unit vector, then the magnitude of their difference is the root of three. **Reason (R):** To find the resultant of two vectors, we use the square law. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
75	**Assertion (A):** If $\left\|\vec{P}+\vec{Q}\right\| = \left\|\vec{P}-\vec{Q}\right\|$, then $\vec{P}$	

	must be perpendicular to $\vec{Q}$. **Reason (R):** The above relation will hold even when $\vec{Q}$ is a null vector. a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true but R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	

Economics

Q 1. Project Files to be prepared on the following topics:

1. **Aditya Aryan** - Microeconomics and its scope
2. **Janya -** Microeconomics and its scope
3. **Sneha -** Statistics and its Scope
4. **Mishika** - Indifference Curve Analysis
5. **Nihal -** Indifference Curve Analysis
6. **Ishant**- Collection of data
7. **Lakshita -** Consumer's Equilibrium

Q 2. Complete the Following Worksheet in the Microeconomics notebook:

ECONOMICS WORKSHEET

Section A – Statistics for Economics
Chapters: Introduction and Collection of Data

1. Economics is primarily concerned with:
a) Weather conditions
b) Human behaviour related to scarcity
c) Political systems
d) Scientific inventions

2. Primary data refers to:
a) Data collected by newspapers
b) Data collected first-hand by the investigator
c) Data collected from internet sources
d) Published government reports

3. Which of the following is a source of secondary data?
a) Personal interview
b) Questionnaire survey
c) Census conducted by investigator
d) Government publications

4. The method in which information is collected through trained investigators is called:
a) Observation method
b) Personal interview
c) Indirect oral investigation
d) Enumerator method

5. Which of the following is NOT a feature of statistics?
a) Statistics are numerically expressed
b) Statistics are affected by the multiplicity of causes
c) Statistics deal with a single fact
d) Statistics are collected

6. Assertion (A): The census method provides more accurate information.
Reason (R): In the census method, data is collected from every unit of the population.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

7. Define statistics in the singular and plural sense.

8. Distinguish between primary data and secondary data.

9. Explain any three functions of statistics.

10. What are the precautions to be taken while using secondary data?

11. Explain the difference between the census method and the sample method.

12. Explain the importance of statistics in Economics.

13. Discuss various methods of collecting primary data.

14. What is a questionnaire? State the essentials of a good questionnaire.

15. Explain the merits and demerits of the sampling method.

16. Differentiate between sources of primary and secondary data with suitable examples.

Section B – Microeconomics
Chapters: Introduction and Consumer's Equilibrium
17. Microeconomics deals with:
a) Economy as a whole
b) Individual economic units
c) National income
d) Inflation rate

18. Utility means:
a) Cost of production
b) Want-satisfying power of a commodity
c) Price of a commodity
d) Profit earned by a firm

19. According to the Law of Diminishing Marginal Utility:
a) Total utility always falls
b) Marginal utility increases continuously
c) Marginal utility decreases with additional consumption
d) Utility remains constant

20. Consumer's equilibrium refers to a situation where:
a) Consumer spends no income
b) Consumer gets maximum satisfaction
c) Prices are constant
d) Demand equal's supply

21. Which approach to consumer equilibrium is based on indifference curves?
a) Utility approach
b) Cardinal approach
c) Ordinal approach
d) Demand approach

22. Assertion (A): Marginal utility of a commodity decreases as more units are consumed.
Reason (R): Human wants are unlimited.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true, but R is not the correct explanation of A
c) A is true, but R is false

d) A is false, but R is true

23. Define microeconomics.

24. Explain the central problems of an economy.

25. State the law of diminishing marginal utility.

26. Differentiate between total utility and marginal utility.

27. Explain consumer equilibrium with the help of utility analysis.

28. Explain the meaning and scope of microeconomics.

29. Discuss the basic problems of an economy with suitable examples.

30. Explain the law of diminishing marginal utility with assumptions and a schedule.

Psychology

Q.1 Prepare a PowerPoint Presentation on the topics:

1. **Aditya Aryan:** Introduction to Psychology
- Meaning & definition of psychology
- Why is psychology called a science
2**. Dhanvi:** Branches of Psychology
- Clinical, Cognitive, Social, Developmental
3. Khushi: Perspectives in Psychology
- Behavioural
- Cognitive
- Psychoanalytic
- Humanistic
4. Mishika: Psychology in Everyday Life
- Role in school, health, relationships
- Importance for students
5. Nihal: Types of Behaviour
- Overt vs Covert behaviour
- Examples from daily life
6**. Jenya:** Indian Psychology
- Concept of Self in Indian Psychology
- Indian vs Western Perspectives in Psychology

7. Sneha: Careers in Psychology
-Different job opportunities in Psychology
8. Misty: Basic vs Applied Psychology
-Differentiate both with the help of examples
9. Lakshita: Evolution of Psychology in India
- A timeline covering the experimental phase
-Western perspectives and ancient texts

Guidelines for Presentation

1. Prepare a PowerPoint Presentation (PPT) based on the topic assigned to you (as per your name)

Slide Format (Total: 6 Slides)

- **Slide 1:** Introduction Slide

Name
Roll Number
Class & Section
Subject
Topic

- **Slides 2–5:** Content Slides

Include key points related to your topic. Keep content clear, brief, and relevant

- **Slide 6:** Thank You Slide

Add a simple “Thank You” message

2**. Submission Instructions**

- Submit a hard copy (printed) of your topic content
- The content should be neatly presented.
- Ensure proper headings and clarity.

3. Presentation Instructions

- Each student will present for 5 minutes
- Explain the topic in your own words (avoid reading directly from slides)
- Maintain confidence, clarity, and eye contact.

Q 2. Complete the Following Worksheet in the Psychology Notebook:

PSYCHOLOGY WORKSHEET

Part 1: Multiple Choice Questions (MCQs)

1. Who established the first psychological laboratory at the University of Leipzig, Germany, in 1879?
a) William James
b) Wilhelm Wundt
c) J.B. Watson
d) Sigmund Freud

2. Which school of psychology focuses on the structure of the mind and uses the method of introspection?
a) Functionalism
b) Gestalt
c) Structuralism
d) Behaviourism

3. Formally, psychology is defined as a science that studies:
a) Only animal behaviour
b) Mental processes, experiences, and behaviour
c) The soul and spirit
d) Past life memories

4. Who is known as the founder of Psychoanalysis?
a) Carl Rogers

b) B.F. Skinner
c) Jean Piaget
d) Sigmund Freud

5. Which branch of psychology deals with workplace behaviour, employee motivation, and organizational productivity?
a) Clinical Psychology
b) Developmental Psychology
c) Industrial/Organizational Psychology
d) Educational Psychology

Part 2: Short Answer Type Questions
6. Define Psychology. How does it function as a natural science as well as a social science?
7. Differentiate between Overt and Covert Behaviour. Give one example for each.
8. What is Introspection? Which school of psychology primarily used this method, and why was it criticized?
9. Distinguish between Structuralism and Functionalism.
10. How are Clinical Psychologists different from Counselling Psychologists? Provide a brief distinction of their work.

Part 3: Long Answer Type Questions
11. Explain the evolution of psychology from a philosophical study to a modern scientific discipline. Highlight the major contributions of Behaviourists and Humanists.

12."Psychology is not just a study of mental disorders, but it helps solve everyday societal problems. “Justify this statement with the help of any three applied branches of psychology.

Part 4: Case-Based Questions
13. Analyze this scenario:
Rohan wants to understand why people in his neighbourhood sometimes behave aggressively during hot summer days. How do you think a biological psychologist, a cognitive psychologist, and a socio-cultural psychologist would differ in their approach to explaining this behaviour?

Computer Science

Q. 1 Prepare a PowerPoint Presentation (PPT) on **any ONE** of the following topics:

Topic: “Emerging Trends in Computer Science”

Topic Options (Choose One)
(a) Artificial Intelligence (AI)
(b) Cyber Security
(c) Cloud Computing
(d) Data Science
(e) Internet of Things (IoT)
(f) Blockchain Technology

(g) Ethical Hacking
(h) Big Data

PPT Structure (15–20 Slides)
Slide 1: Title Slide
Project Title
Student Name
Class & Section
School Name
Slide 2: Introduction
What is the topic?
Basic definition
Slide 3–4: History & Evolution
How it started
Important milestones
Slide 5–7: Working Concept
How the technology works
Simple explanation with a diagram
Slide 8–10: Applications
Real-life uses
Examples (daily life, industries, education, etc.)
Slide 11–12: Advantages
Benefits of the technology
Limitations
Risks or issues
Slide 15–16: Future Scope
Career opportunities
Future developments
Slide 17: Case Study
Example of a company or real-world use
Slide 18: Conclusion
Summary in 4–5 points
Slide 19: Bibliography
Websites / Books used
Slide 20: Thank You Slide

Design Instructions

(I) Use simple and neat themes
(II)Add images, charts, icons
(III) Avoid too much text (use bullet points)
(IV) Use a readable font (Calibri / Arial)
(V) Font size:
(VI) Heading: 32–40
(VII) Content: 20–24

Activity-Based Tasks (Compulsory)
✔ Task 1:

Insert at least 3 diagrams or flowcharts

✔ Task 2:

Add 1 short video link or QR code related to your topic

✔ Task 3:

Include 1 real-life example from India

✔ Task 4:

Prepare 2 questions for class discussion

Computer Worksheet

Section A – Multiple Choice Questions

1. Which of the following is an input device?
   a) Printer
   b) Monitor
   c) Keyboard
   d) Speaker
2. The brain of the computer is:
   a) RAM
   b) CPU
   c) Hard Disk
   d) ROM
3. Binary number system uses:
   a) 2 digits
   b) 8 digits
   c) 10 digits
   d) 16 digits
4. Decimal equivalent of binary number 1010 is:
   a) 8
   b) 9
   c) 10
   d) 12
5. Which gate gives output 1 only when both inputs are 1?
   a) OR Gate
   b) NOT Gate
   c) NAND Gate
   d) AND Gate
6. Which Boolean operator represents logical addition?
   a) AND
   b) OR
   c) NOT
   d) XOR
7. Algorithm is:
   a) Hardware device

b) Step-by-step solution to a problem
c) Programming language
d) Antivirus software

8. Flowchart uses symbols to represent:
   a) Programs
   b) Data types
   c) Steps of a solution
   d) CPU operations
9. Which memory is volatile?
   a) ROM
   b) Hard Disk
   c) RAM
   d) DVD
10. Hexadecimal system uses base:
    a) 2
    b) 8
    c) 10
    d) 16
11. Full form of ALU is:
    a) Arithmetic Logic Unit
    b) Array Logic Unit
    c) Arithmetic Link Unit
    d) Automatic Logic Unit
12. Which gate is known as an inverter?
    a) OR Gate
    b) NOT Gate
    c) NAND Gate
    d) XOR Gate

Section B – Very Short Answer Questions

13. Differentiate between hardware and software.
14. Convert the decimal number 25 into binary.
15. What is the purpose of a flowchart?
16. Write the truth table of the AND gate.
17. Define the following:
    a) Bit
    b) Byte
18. What is primary memory? Give two examples.

Section C – Short Answer Questions

19. Explain the functional units of a computer system.
20. Convert the following:
    a) $(110101)_2$ into decimal
    b) $(45)_{10}$ into binary
21. Differentiate between RAM and ROM.
22. Explain any three advantages of algorithms.
23. Draw the symbols used for:
    a) Start/Stop
    b) Decision
    c) Input/Output

Section D – Long Answer Questions

24. Explain different types of software with suitable examples.
25. Perform the following conversions:
    a) $(101101)_2$ into decimal
    b) $(78)_{10}$ into binary
    c) $(2F)_{16}$ into decimal
26. Explain the working of AND, OR, and NOT gates with truth tables.
27. Write an algorithm and draw a flowchart to find the largest of two numbers.

OR

Write an algorithm and draw a flowchart to calculate the sum of the first 10 natural numbers.

Section E – Case Study-Based Questions

28. A school is purchasing a new computer system for its computer lab. The lab requires fast processing speed, enough memory for storing files, and software for creating documents and presentations.

Answer the following questions:

a) Name the component responsible for processing data.
b) Which memory is used for temporary storage?
c) Name one system software and one application software.
d) Why is storage important in a computer system?

29. A shopkeeper uses barcode scanners and billing software in his store. The software automatically calculates totals and generates bills.

Answer the following questions:

a) Name the input device used in the store.
b) Which type of software is billing software?
c) What is the role of algorithms in billing software?
d) Name one advantage of computerized billing.

History

Q 1. Project Files to be prepared on the following topics:

1. **Aditya Aryan:** Focus on urban life, temples, and the social structure of Ur and Mari in Mesopotamian Civilization.
2. **Nihal**: Development of writing, trade, and economic life of Mesopotamian Civilisation.
3. **Sneha**: Focus on Mesopotamian literature, astronomy, and its legacy.
4. **Lakshita:** The Epic of Gilgamesh: What this legendary tale reveals about the religious and social values of the time.

Q 2. Complete the Following Worksheet in the history notebook:

SECTION A: Multiple Choice Questions
1. Which present-day country corresponds to the ancient region of Mesopotamia?
A) Egypt
B) Iraq
C) Iran
D) Syria

2. What was the primary material used for writing in ancient Mesopotamia?
A) Papyrus
B) Palm leaves
C) Clay tablets
D) Parchment

3. Who was the famous ancient king associated with the Epic of Gilgamesh?
A) Sargon
B) Ashurbanipal
C) Gilgamesh
D) Hammurabi

4. The earliest known temples in Mesopotamia were built around which period?
A) \(5000\) BCE
B) \(3000\) BCE
C) \(5000\) CE
D) \(3000\) CE

Section B: Short Answer Questions
5. Define Cuneiform: What is it, and who used it?

6. Role of Temples: Explain three major functions of temples in Mesopotamian urban life.

7. System of Exchange: How did the Mesopotamians manage trade and record-keeping without a standardized currency?

Section C: Long Answer Questions

8. Urbanization in Mesopotamia: Describe the town planning, housing, and drainage systems of early Mesopotamian cities.

9. Significance of Writing: Analyze how writing revolutionized administration, trade, and the preservation of culture in early civilizations

10. Royal Palace at Mari: Discuss the key features of the royal palace at Mari. How did it function as both a residence and an administrative hub?

Section D: Map Work:

On a blank outline map of West Asia, locate the rivers Tigris and Euphrates, and mark important cities like Ur, Uruk, and Mari.

Legal studies

Q 1. Project Files to be prepared on the following topic:

1. **Aditya Aryan**- Cyber Laws in India: Protection against cybercrime.

Q 2. Complete the Following Worksheet in the Legal Studies Notebook:

LEGAL STUDIES WORKSHEET

Part A: Very Short Answer & Objective Type

1. According to legal scholars, what are the four essential elements of a State?
2. State the difference between internal and external sovereignty.
3. Name the three key philosophers associated with the Social Contract Theory.
4. Which theory of the state argues that the state is an expansion of the family and led by a male head?
5. What is the fundamental distinction between a state and a nation?

Part B: Short Answer Questions

6. Differentiate between a minimal state and a collectivized state.
7. Summarize Thomas Hobbes' view on the state of nature and the need for a sovereign.
8. Briefly explain Aristotle's classification of government into monarchy, aristocracy, and polity.

9. How do the theories of John Locke and Jean-Jacques Rousseau differ regarding popular sovereignty?

Part C: Long Answer / Value-Based Questions

10. Compare and Contrast: Outline the differing philosophies of Hobbes, Locke, and Rousseau regarding the Social Contract Theory. How did their respective views influence the modern concept of the state?
11. Analysis:
Read the statement: "Sovereignty is the supreme power of the state over citizens and subjects, unrestrained by law." Explain this concept in the context of the Indian legal and political system.

Political Science

Q 1. Project Files to be prepared on the following topics:

1. **Aditya Aryan**- Working of the Indian Judiciary system
2. **Nihal**-Fundamental Rights and Duties
3. **Sneha**-Making of the Indian Constitution
4. **Lakshita-**Borrowed Features of the Indian Constitution: Research the various constitutional features India adopted from other nations

Q 2. Complete the Following Worksheet in the Political Science-Part 1 Notebook:

POLITICAL SCIENCE WORKSHEET

Section A: Multiple Choice Questions (MCQs)

1. Which of the following is the primary function of a constitution?
a) To define the powers of the judiciary alone.
b) To provide a set of basic rules that allow for minimal coordination among members of society.
c) To ensure that one political party remains in power permanently
d) To dictate the economic policies of the country.

2. Who among the following was the Chairman of the Drafting Committee of the Indian Constituent Assembly?
a) Dr. Rajendra Prasad
b) Jawaharlal Nehru
c) Dr. B.R. Ambedkar
d) Sardar Vallabhbhai Patel

3. From which country did the framers of the Indian Constitution borrow the concept of Fundamental Rights?
a) USSR
b) USA
c) Australia
d) Ireland

4. Assertion (A): The Constituent Assembly of India had members from various backgrounds, castes, religions, and regions.
Reason (R): It was elected on the basis of universal adult franchise by the people of India.
Codes:
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is NOT the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

Part 2: Very Short Answer Type Questions
5. What is a constitution?
6.Who drafted the Indian Constitution?
7.Name any two functions of a constitution.
8.What is the supreme law of a country?
9.What does a constitution tell about the government?

Part 3: Short Answer Type Questions
10. Explain why society needs a constitution.
11."The Indian Constitution is a product of various compromises and consensus." Justify this statement.
12. How does the Constitution limit the power of the government?
13. State the difference between an unwritten and a written constitution.
14. Define a constitution.
15. State any two basic functions of a constitution.
16. How does a constitution limit the power of the government?

Part 4: Long Answer Type Questions
17. Describe the role played by the Constituent Assembly in framing the Indian Constitution.
18. Explain how the Indian Constitution balances flexibility and rigidity.

English

Section A – Poetry Enrichment

1. Poetry Scrapbook Project
Prepare a creative scrapbook on any two poems from your syllabus. Include:
- Poet's introduction with a picture
- Theme of the poem
- Summary in your own words
- Literary devices used
- Favourite lines with explanation
- A creative illustration/doodle related to the poem
- One self-written paragraph on "What I learnt from the poem."

2. Comparative Poetry Activity

Compare the ideas, emotions, or poetic style of any two poems studied in class.
Write in about 250–300 words:

- Similarities
- Differences
- Message conveyed
- Which poem impressed you more and why

Podcast / Speaking Task

Prepare a spoken presentation on:
"How Poetry Reflects Real Life"
Guidelines:

- Duration: 2–3 minutes
- Speak clearly and confidently
- Include examples from poems studied in class
- Share your personal opinion

Advertisement Writing Questions

1. You are the owner of a coaching institute offering spoken English and personality development classes for teenagers. Draft a suitable advertisement for a local newspaper.
2. Your school is organizing a summer camp for students, including dance, music, art, yoga, and sports activities. Design an attractive advertisement inviting registrations.
3. You wish to sell your old bicycle in good condition. Draft a classified advertisement mentioning all necessary details.
4. A new bookstore has opened in your city with discounts on academic and competitive exam books. Prepare an advertisement to attract customers.
5. Draft an advertisement for a "Save Water, Save Life" awareness campaign organized by your school.

Poster Making Questions

1- Design a poster on the topic:
"Say No to Plastic"

2. Prepare a poster to spread awareness about:
Cyber Safety and Responsible Use of Social Media

3. Make a poster promoting:
Tree Plantation Drive

4. Design a poster for your school's:
Annual Cultural Fest

5. Create a poster on:

Importance of Mental Well-being Among Teenagers

Q2. Grammar Section

Change the following sentences from Active Voice to Passive Voice.

1. The committee has rejected all the proposals submitted by the participants.
2. Someone had stolen the confidential documents before the meeting began.
3. The management will announce the final results next week.
4. People believe that the scientist discovered a revolutionary formula.

5. The teacher is evaluating the answer sheets very carefully.
6. They have been constructing the bridge for the last two years.
7. Who wrote this remarkable research paper?
8. The storm destroyed several houses in the coastal village.
9. The authorities should implement stricter laws to control pollution.
10. Did the principal appreciate your project during the exhibition?

b. Transform the following sentences as directed without changing their meaning.

1. As soon as the teacher entered the class, the students became silent.
(Begin with: No sooner…)
2. He is too weak to lift the heavy box.
(Rewrite using "so…that")
3. Only a few students in the class are as intelligent as Riya.
(Rewrite using the superlative degree)
4. The moment the rain stopped, the children rushed outside.
(Begin with: Hardly…)
5. Everyone admired the beauty of the ancient monument.
(Change into an exclamatory sentence)
6. If you do not work hard, you will not succeed.
(Rewrite using "unless")
7. She said, "I cannot attend the function today."
(Change into indirect speech)
8. Despite being tired, he completed the assignment on time.
(Begin with: Although…)
9. The news was so shocking that nobody could believe it.
(Rewrite using "too…to")
10. Shakespeare was one of the greatest dramatists in the world.
(Rewrite using the positive degree)

Extract-Based Questions

Extract1.
"It's silence silences. Here is the odd thing:
I have no photograph of her
She has gone away
And the sea seems to have changed less
Washed their terribly transient feet."

MCQs

1. The phrase "Its silence silences" suggests:
a) joy and celebration
b) deep emotional pain and emptiness
c) excitement and energy
d) anger and frustration
2. The poet calls human life "transient" because it is:
a) peaceful
b) temporary
c) valuable
d) difficult

Short Answer Questions

1. Why does the poet find the sea less changed than human life?
2. What does the silence mentioned in the extract symbolise?

Fill in the Blank

The sea washed their terribly _____ feet.

Extract 2.

“For a moment, she was like the autumn landscape in the mountains, and could be said to have become one with nature.”

MCQs

1. The comparison with the autumn landscape suggests the grandmothers:

a) excitement
b) declining age and calmness
c) anger
d) pride

2. The phrase “one with nature” means:

a) She loved gardening
b) She was deeply connected with peace and spirituality
c) She disliked people
d) She lived in the forests

Short Answer Questions

1. How does the author use nature imagery to describe the grandmother?
2. What does this description reveal about the narrator’s feelings for his grandmother?

Fill in the Blank

The grandmother could be said to have become one with _____.

Extract 3.

“No more large waves broke over us. The wind was easing, and we knew our ordeal was nearly over.”

MCQs

1. The word “ordeal” refers to:

a) a joyful experience
b) a difficult and painful experience
c) a celebration
d) an ordinary journey

2. The easing wind symbolised:

a) fresh danger
b) loss of hope
c) relief and survival
d) confusion

Short Answer Questions

1. What emotions did the family experience as the storm weakened?
2. How did the voyage transform the narrator and his family emotionally?

Fill in the Blank
The wind was _____ and their ordeal was nearly over.

Competency-Based Questions

1. The poem shows how photographs preserve memories but also remind people of loss and change. Explain how memories of loved ones influence a person's emotions and relationships in life.
(Answer in 120–150 words.)

2. The narrator's grandmother represents traditional values, simplicity, and emotional strength. Compare these qualities with the lifestyle and values of modern society today.
(Answer in 120–150 words.)

3. The family survived the dangerous storm because of courage, unity, and hope. Explain how teamwork and emotional support help people face difficult situations successfully.
(Answer in 120–150 words.)

4. Aram and Mourad belonged to a family known for honesty, yet they secretly kept the horse. Explain how values and temptation can sometimes create moral conflict in a person's life.
(Answer in 120–150 words.)

Comparison-Based Questions

1. Compare the themes of memory, loss, and emotional attachment in A Photograph and The Portrait of a Lady. How do both works portray the bond between generations?

(Answer in 120–150 words.)

2. Both We're Not Afraid to Die... if We Can All Be Together and The Summer of the Beautiful White Horse highlight the importance of values and relationships. Compare how courage, trust, and family support influence the characters in the two stories.

(Answer in 120–150 words.)

Accountancy

Q.1 Prepare a Project on the topics mentioned below:
1. Principles of Accounting or
2. Source Documents to Vouchers
1. **Aim**: To understand the journey from transaction → source document → voucher → recording.
2. **Collect & Paste:** Any 4 source documents: Cash Memo, GST Invoice, Pay-in-slip, Cheque counterfoil.

3. **Prepare**: 1 Cash Voucher + 1 Journal Voucher using the above documents.
4. **Write**: 6 lines on “Why are vouchers called the base of the accounting system?”

Creative Corner
Make a flowchart/chart on “Types of Accounts with Golden Rules”. Use example

Q 2. Complete the following worksheet in the Accounts Notebook.

Accountancy Worksheet

Section A –

1. Accounting is primarily concerned with:
   a) Recording only cash transactions
   b) Identifying, recording, and communicating economic information
   c) Preparing government budgets
   d) Selling goods and services

2. Which of the following is NOT a function of accounting?
   a) Measurement of financial performance
   b) Providing information to users
   c) Fixing market price of products
   d) Facilitating decision making

3. According to the Going Concern assumption, a business is assumed to:
   a) Close down after one year
   b) Continue for a foreseeable future
   c) Be sold immediately
   d) Have no assets

4. The principle that requires same accounting methods to be followed year after year is:
   a) Consistency principle
   b) Conservatism principle
   c) Dual aspect principle
   d) Cost principle

5. Assertion (A): Money Measurement Concept states that only transactions measurable in money are recorded.
   Reason (R): Qualitative aspects like employee honesty cannot be recorded in books.
   a) Both A and R are true and R is the correct explanation of A
   b) Both A and R are true but R is not the correct explanation of A
   c) A is true but R is false
   d) A is false but R is true

Section -B

6. Define accounting. Explain any three objectives of accounting.
7. Distinguish between bookkeeping and accounting.
8. Explain the importance of accounting for internal and external users.
9. Discuss the Accounting Principle of Conservatism with an example.

Section C

10. Differentiate between Accounting Concepts and Accounting Conventions with examples
11. Define Double Entry System of Accounting.
12. Explain the three types of accounts with one example each.
13. State the Traditional Rules of Debit and Credit.
14. Differentiate between Personal Account and Impersonal Account.
15. Explain the Modern Rules of Debit and Credit for Assets and Liabilities
16. Apply the rules of Dr and Cr to record:
    a) Started business with cash 50,000
    b) Purchased goods for cash 10,000
    c) Paid salary 2,000

17. Explain with examples how the Dual Aspect Concept forms the basis of the rules of Debit and Credit
18. Explain the following principles:
    a) Business Entity principle
    b) Matching principle

Section D

19. Use expanded equation: Assets = Liabilities + Capital

1. Commenced business with cash ₹6,00,000.
2. Bought machinery ₹1,80,000 by cheque.
3. Goods purchased ₹90,000, 50% cash, 50% credit.
4. Sold goods for ₹1,40,000 on credit, cost ₹1,00,000.
5. Paid wages ₹18,000.
6. Received commission ₹5,000.
7. Depreciation on machinery ₹10,000.

20. Show the effect on the Accounting Equation.

Opening equation: Assets ₹9,00,000 = Liabilities ₹3,00,000 + Capital ₹6,00,000

Transactions during the year:

1. Additional capital introduced ₹1,00,000.
2. Profit earned ₹1,50,000.
3. Drawings made ₹40,000.
4. Loan taken ₹2,00,000.
5. Assets purchased ₹2,50,000.

Find closing Assets, Liabilities, and Capital

BUSINESS STUDIES

Q.1 Prepare a Project on the topic mentioned below:

Topic: A Visit to a Bank

1. **Objective**: To understand various banking services available to businesses.
2. **Work**: Visit any bank branch near your house. Collect information & paste brochures/ photos of:
   (i) Types of Bank Accounts – Saving, Current, FD
   (ii) Any 2 Digital Services – UPI, Net Banking, Debit Card
   (iii) Any 1 Loan Facility for business
3. **Interview:** Ask the manager 3 questions: "Which account is best for a small trader?", "What is the minimum balance?" "How is e-banking safe?" Write answers.
4. **Conclusion**
5. 5 lines on "Role of banks in business growth".

Creative Task

Make a collage/chart on *"Types of Industry: Primary, Secondary, Tertiary" * with 2 examples + pictures for each. OR
Prepare a *Flowchart on 'Forms of Business Organisation'* showing features of Sole Proprietorship, Partnership.

Q 2. Complete the following worksheet in the Business Studies notebook.

BUSINESS STUDIES Worksheet

Section A

1. The primary objective of business is:
   a) Employee satisfaction
   b) social welfare
   c) Earning profit
   d) Producing goods

2. Which of the following is NOT an economic activity?
   a) A teacher teaching in school
   b) A doctor treating patients in a hospital
   c) A mother cooking food for her family
   d) A shopkeeper selling goods

3. Buying goods from one country and selling to another is called:
   a) Home trade
   b) Entrepot trade
   c) Foreign trade

d) Retail trade

4. The risk which arises due to fire, theft or strike is called:
a) Speculative risk
b) Pure risk
c) Economic risk
d) Insurable risk

5. Which of the following is NOT a characteristic of business?
a) Production of goods and services
b) Sale or exchange of goods and services
c) Regularity in dealings
d) Absence of profit motive

6. Assertion (A): Business is an economic activity.
Reason (R): Business is undertaken to earn money and satisfy human wants.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

7. Assertion (A): A company has a separate legal entity.
Reason (R): It is created by law and can hold property in its own name.
a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true but R is not the correct explanation of A
c) A is true but R is false
d) A is false but R is true

Section B

7. Define business.
8. Distinguish between economic and non-economic activities.
9. Explain any three objectives of business.
10. What are the causes of business risk?
11. Explain the difference between industry and commerce.

Section C

12. Explain the role of profit in business.
13. Discuss various types of industries with examples.
14. What are ‘aids to trade’? Explain any four.
15. Explain the merits and demerits of business risk.
16. Differentiate between business, profession and employment with suitable examples.

Section D

17. Define sole proprietorship. Explain the features of a sole proprietorship
18. State any two merits of a Joint Hindu Family business.
19. Differentiate between a private company and a public company.
20. Explain the steps involved in the formation of a company.