BJS PUBLIC SCHOOL

SUMMER HOLIDAY HOMEWORK

CLASS- XII

SESSION: 2026-2027

ENGLISH

1. Rewrite the conclusion of a story like The Last Lesson, imagining a different fate for M.Hamel or Franz.

2. Character Diaries: Write a diary entry as Saheb or Mukesh from Lost Spring, expressing their hidden dreams and daily frustrations.
   Create a professional resume for your future self, outlining the career path you intend to pursue.

3. Design eye-catching posters on topics like "Education for Every Child" (Lost Spring) or "Conservation of Historical Monuments"

4. Being Innovative with ideas:-
   What to do? What could be the alternate ending of the lesson The Third Level?

5. Watch and Reflect on the following TED Talks and write 150 -200 words for each, summarizing your takeaway from each:
   https://youtu.be/7Lc_dlVrg5M?si=lQSaUpCd4cxKkX2f
   https://youtu.be/vacGRuHDtO0?si=pr4_P0mO3sQnKnwy
   https://youtu.be/aDG1T0kJnd4?si=JcZPUUWUCr4L2RXi

6. PROJECT
   CONTENT OF THE PROJECT FILE:
   - Cover page, with the title of the project, school details and details of the student.
   - Certificate of Completion under the guidance of the teacher.
   - Objectives of the topic.
   - Action Plan for the completion of assigned tasks (steps involved in doing the project).
   - The 800–1000 word essay/report.
   - Student reflections (what new learning experience/outcome you have achieved after completing the project).
   - If possible, photographs that capture positive learning experience of the students (collages/pics from various online sources).
   - List of Resources/Bibliography/ Citation (Last page of the project file)

   INSTRUCTIONS:
   - The project should be neat, legible, with an emphasis on quality of content, accuracy of information, creative expression, proper sequencing and should be relevant as per your assigned topic.
   - Project to be submitted handwritten on ruled worksheets or A4 size paper.
   - Topics are given below-
     a) Smart Phones –Applications and Adverse Effects
     b) Declining Water Table- Causes and Effects
     c) Alternative Resources of Energy and its Benefits
     d) Coaching Centres- will new guidelines work?
     e) Gadgets have Consumed the Pleasures of Reading
     f) Driving v/s Cycling- Ease has Compromised Health
     g) Fast Food is Fast Entry into Unhealthy Zones
     h) Youth falling Prey to Vaping in Guise of Modernization
     i)My Trash-How can it be Converted into Cash
     j) Online shopping has Opened Avenues of Online Frauds

PHYSICS

Unit-1 Electrostatics

(i) Find electric field intensity at a point on axial line due to electric dipole.

(ii) Find electric field intensity at a point on equatorial line due to electric dipole.

(iii) Derive expression for torque and potential when dipole placed in uniform electric field.

(iv) Prove that there is no work done in equipotential surface.

(v) Using Gauss's law (a) find electric field near straight wire

(b) find electric field near spherical shell

(c) find electric field near thin charge sheet

(vi) Derive expression for capacitance of parallel plate capacitor.

(vii) Derive expression for capacitance of parallel plate capacitor when dielectric slab placed in it.

(vii) Find formula for energy stored in parallel plate capacitor.

(viii) solve five numerical on each topic which given following

Flux, Potential, Capacitor

Unit-2 Current electricity

(i) Derive expression for drift speed.

(ii) Find formula for emf and internal resistance when two cells are in series and parallel.

(iii) solve five numerical on each topic which given following

Kirchhoff's law, Meter bridge, Resistance

3. **Complete written work of practical file.**

CHEMISTRY

Prepare one Investigatory Project on any one of the following topic or any other topic of your choice based on concept of Chemistry (as per CBSE guidelines).

POINTERS FOR MAKING PROJECT REPORT

The material should be placed and bound in the following order:

1. Top Sheet of transparent plastic –

The top page of your report should carry the following information in printed form or handwritten in neat block letters:

Title of Project:

Name of Student:

Roll Number:

2. Acknowledgement(as per CBSE guidelines)
3. Certificate (as per CBSE guidelines)
4. Aim of Project
5. Apparatus required to perform the project
6. Principle/theory of the project
7. Working – Brief description of procedure performed to carry out the project And last References/bibliography

Please note

a. black cover of plastic may be opaque or transparent

b. The project should be hand written

Use A-4 size sheets only

List of Investigatory Projects

S.NO AIM

1. To determine the aspirin content in different medicines.
2. To compare the caffeine contents of different samples of tea.
3. To study the presence of adulterants in chili powder, turmeric powder and pepper.
4. To observe the crystallization of salts in normal and magnetic conditions
5. To prepare a perfume sample and analyse its contents
6. To study the rate of reaction between different alcohols and dilute HCL (Lucas test)
7. To measure nicotine content in various cancer causing products.
8. To verify Faraday's law of electrolysis
9. Preparation of biodiesel and analyzing its components.
10. To determine the cations and anions present in a powdered sample of Calcium Sandoz.
11. To estimate the content of vitamin-C in different fruits.
12. To study the change in pH of various samples like acids due to passage of electricity
13. To study the quantity of casein present in different samples of milk.
14. To determine the percentage of acetic acid present in vinegar.
15. To analyse the components of Hair Gel.
16. To prepare potash alum from scratch aluminium.
17. To determine presence and percentage of nickel in chocolate.
18. To study the efficiency of different antacids in neutralizing stomach acid.
19. To determine presence and percentage of nickel in chocolate.
20. To study the efficiency of different antacids in neutralizing stomach acid.
21. To prepare a sample of soybean milk.
22. To find elevation of boiling point of water on adding different solutes to water
23. To prepare soap and then determine its foaming capacity.
24. To analyse the presence of harmful chemicals in Holi colours.
25. To study the composition of cold drinks for sucrose glucose, CO_2 & caffeine content.
26. To study the presence of adulterants in vegetable oil, ghee, and butter.
27. To study the effect of metal coupling on rusting of iron.

Chapter - 4

CHEMICAL KINETICS

1 MARKS QUESTION

1. The gas phase decomposition of acetaldehyde

$$CH_3CHO \rightarrow CH_4+CO$$

Follows the rate law.

What are the units of its rate constant.

Ans. $Atm^{-1/2}sec^{-1}$

2. State the order with respect to each reactant and overall reaction.

$$H_2O + 3I^- + 2H^+ \rightarrow 2H_2O + I_3^-$$

Rate = $k[H_2O_2]^1[I^-]^1$

Ans. Order of reaction= 1+1= 2

3. Give one example of pseudo first order reaction**.**

Ans. Hydrolysis of an ester

$CH_3COOC_2H_5 + H_2O \rightarrow CH_3COOH + C_2H_5OH$

4. The conversion of molecules X to Y follows the second order of kinetics. If concentration of X is increased 3 times, how will it affect the rate of formation of Y.

Ans. Rate = $k [A]^2$
= $k [3A]^2$
= $k [9a]^2$

The rate of formation will become nine times.

5. The rate law for a reaction is

Rate = $K [A] [B]^{3/2}$

Can the reaction be an elementary process? Explain.

Ans. No, an elementary process would have a rate law with orders equal to its molecularities and therefore must be in integral form.

6. What do you understand by ‘rate of reaction’?
7. Name the factors on which the rate of a particular reaction depends.
8. Why rate of reaction does not remain constant throughout?
9. Define specific reaction rate or rate constant.

10. What is half-life period of a reaction?

2 MARKS QUESTION

1. The rate of a particular reaction quadruples when the temperature changes from 293K to 313K. Calculate activation energy.

Ans. $K_2/K_1 = 4$,

T1= 293K T2 = 313K

Log [K2/K1] = Ea[T2-T1]/19.15

Thus on calculating and substituting values we get…..

Ea = 52.86 KJ mol^{-1}

2. If the decomposition of nitrogen oxide as

$2N_2O_5 \longrightarrow 4NO_2 + O_2$

follows a first order kinetics.

(i) Calculate the rate constant for a 0.05 M solution if the instantaneous rate is 1.5×10^{-6} mol/l/s?

Ans. Rate = K $[N_2O_5]$

$$K = \frac{\text{Rate}}{[N_2O_5]}$$

$$K = \frac{1.5 \times 10^{-6}}{0.05}$$

$K = 3.0 \times 10^{-5}$

ii) What concentration of N_2O_6 would give a rate of 2.45×10^{-5} mol $L^{-1}s^{-1}$

Rate = 2.45×10^{-5} mol $L^{-1}s^{-1}$

$$[N_2O_5] = \frac{\text{Rate}}{K} = \frac{2.45 \times 10^{-5}}{3.0 \times 10^{-5}}$$

= 0.82 M

3) Write the difference between order and molecularity of reaction.

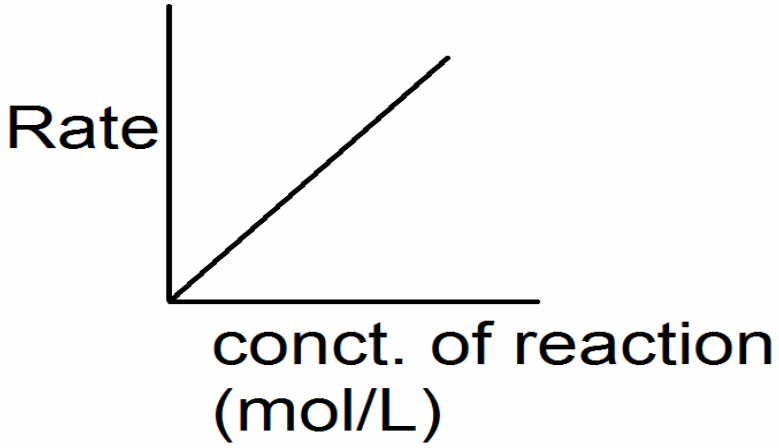
Ans. ORDER	MOLECULARITY
It is the sum of the powers of concentration terms in the rate law expression.	It is the number of reacting speci--es undergoing simultaneously Collision in a reaction.
It is determined experimentally	it is a theoretical concept
Order of reaction need not be a whole number	It is whole no. only
Order of reaction can be zero.	It can't be zero or fractional

4) Define Threshold energy and activation energy. How they are related?
Ans. Threshold Energy: It is the minimum amount of energy which the reactant molecules must possess for the effective collision in forming the products.

Activation Energy: It is the excess energy required by the reactants to undergo chemical reaction.

Activation energy = Threshold energy – Average kinetic energy of molecules.

5(a). Draw a schematic graph showing how the rate of a first order reaction changes in concentration of reactants.



Variation of rate of first of first order reaction with concentration.

(b). rate of reaction is given by the equation
Rate = k [A] 2[B]
What are the units of rate constant for this reaction?
Ans. Rate = k [A] 2[B]

$$K = \frac{\text{mol } L^{-1}s^{-1}}{(\text{mol } L^{-1})^2(\text{mol}^{-1})}$$

$$K = \text{mol}^{-2}L^{2}s^{-1}$$

6. List the factors affecting the rate of reaction.
7. Explain with suitable example, how the molecularity of a reaction is different from the order of a reaction.

8. Define the term 'rate constant' of 'specific reaction rate'.
9. What are Pseudo unimolecular reactions? Explain with the help of a suitable example.
10. What is half life period? Derive and expression for half-life period in case of a first order reaction.

3 marks question

Q1. The rate constant for first order reaction is 60/s. How much time will it take to reduce the concentration of the reaction to 1/10 of its initial value.
Ans:-

$$t = \frac{2.303}{K} \log \frac{[R_0]}{[R]}$$

$$t = \frac{2.303}{K} \log \frac{[R0]}{\frac{1}{10}[R]}$$

$$t = \frac{2.303}{60} \log 10$$

$$t = \frac{2.303}{60} = 3.38 \times 10^{-2} s^{-1}$$

2. The rate of most of reaction double when their temperature is raised from 298k to 308k. Calculate the activation energy of such a reaction.
Ans:-

$$\log \frac{K_2}{K_1} = \frac{E_a}{2.303\ R} \frac{1 - 1}{T_1\ T_2}$$

$$Ea = \frac{2.303 \times 8.314 \times 298 \times 308 \times 0.3010}{1000}$$

Ea = 52.89KJ/mol

3. A first order reaction takes 69.3 min for 50% completion. Set up on equation for determining the time needed for 80% completion.
Ans. $K = \frac{0.693}{T^{1/2}}$
$= 0.693/69.3 min$
$= 10^{-2} min^{-1}$

$$T = \frac{2.303}{K} \log \frac{[R_0]}{[R]}$$

$T = 2.303/10^{-2} \log 5$

T= 160.9min

4. Following reaction takes place in one step
$2NO + O_2 \rightarrow 2NO_2$

How will the rate of the reaction of the above reaction change if the volume of reaction vessel is diminished to 1/3 of its original volume? Will there be any change in the order of reaction with reduced volume?
Ans. $2NO + O_2 \rightarrow 2NO_2$

$dx/dt = k*[NO]_2[O_2]1$

[Since it is one step]

If the volume of reaction vessel is diminished to 1/3, conc. Of both NO and O2 will become 3 time, the rate of reaction increased 27 times.
In the order of reaction with the reduced volume.

5. The decomposition of NH_3 on platinum surface is a zero order reaction. What are the rate of production of N_2 and H_2.
If $k = 2.5 \times 10^{-4}$

Ans. $2NH_3 \rightarrow N_2 + 3H_2$

$$\frac{-1}{2}\frac{d[NH_3]}{dt} = \frac{d[NH_2]}{dt} + \frac{1}{3}\frac{d[H_2]}{dt}$$

$$\frac{-d[NH_3]}{dt} = \text{rate} = k \times [NH_3]^0$$

$= 2.5 \times 10^{-4}\ molL^{-1}sec^{-1}$

$$\frac{d[N_2]}{dt} = -\frac{1}{2}\frac{d[NH_3]}{dt}$$

$= 1/2 \times 2.5 \times 10^{-4}\ molL^{-1}sec^{-1}$

$$d[H_2] = -\frac{3}{2}\frac{d[NH_3]}{dt} = 3/2 \times 2.5 \times 10^{-4}$$

$= 3.75 \times 10^{-44} molL^{-1}sec^{-1}$

$$\text{Rate} = -\frac{d[NH3]}{dt} = k \times [NH3]^0$$

$= 2.5 \times 10^{-4}\ molL^{-1}sec^{-1}$

Rate of production of $N_2 = 2.5 \times 10^{-4}\ molL^{-1}sec^{-1}$

6. How is the rapid change in concentration of reactants/products monitored for fast reactions.
7. What are photochemical reactions? Give two examples,
8. What is the effect of temperature on the rate of reaction? Explain giving reasons.
9. Comment on free energy change of 'photochemical reactions'.
10. State the role of activated complex in a reaction and state its relation with activation energy.

QUESTIONS CARRYING 5 MARKS

1. What do you understand by the rate of a reaction? How it is expressed? How it is the rate of reaction determined?
2. What do you understand by order of a reaction? How does rate law differ from law of mass action? Give two example of each of the reactions of (i) zero order (ii) first order (iii) second order
3. Derive the equation for the rate constant for a first order reaction. What would be the units of the first order rate constant if the concentration is expressed in mole per litre and time in seconds.
4. Explain why the rate of reaction increases with increase in temperature.
5. Briefly explain the effect of temperature on the rate constant of a reaction.

IMPORTANT QUESTIONS

1. The half-life period of two samples are 0.1 and 0.4 seconds. Their initial Concentrations are 200 and 50 mol L^{-1} respectively. What is the order of reaction?

2. What is the ratio of $t_{3/4} : t_{1/2}$ for a first order reaction ?

3. Higher molecularity reactions (viz. molecularity, 4 and above) are very rare. Why?

4. Consider the reaction 2A + B _____> Products

When concentration of B alone was doubled, half life time does not change. When conc. of A alone is doubled, the rate increases by two times. What is the unit of K and what is the order of the reaction?

5. For the reaction, the energy of activation is 75KJ / mol. When the energy of activation of a catalyst is lowered to 20KJ / mol. What is the effect of catalyst on the rate of reaction at 20^0C.

6. The gas phase decomposition of CH_3OCH_3 follows first order of kinetics

$CH_3OCH_3 \rightarrow CH_4(g) + H_2(g) + CO(g)$

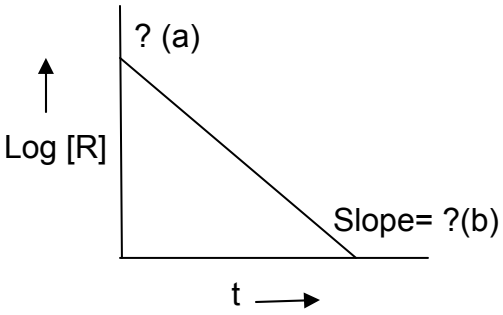
The reaction is carried out at a constant volume of the container at 500^0 C and has $t_{1/2}$ =14.5min.

Initially only dimethyl ether is present at a pressure of 0.40 atm. What is the total pressure of the system after 12 min? Assume ideal behavior.

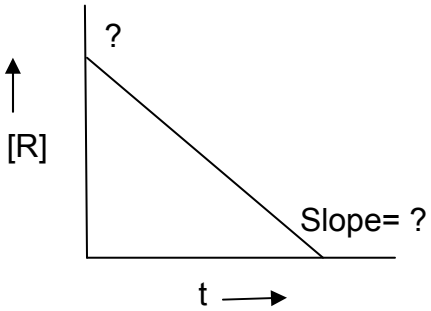
Q 7. See the graph and answer the following question

1). What is the order of r^n

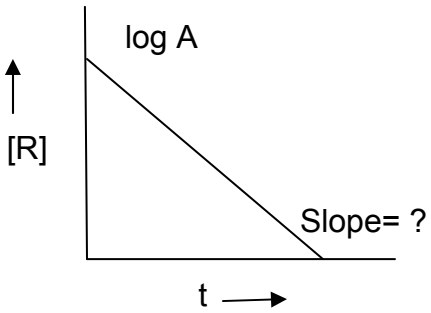
2) what is the value of a and b



q 8. 1) what is the order of r^n
2) what is the value of slope and intercept



q 9.1). what is the value of slope



Ch– 10 Haloalkanes and Haloarenes

IISB/XII/CHEM/worksheet-1

Q.1. Write the structure of

i) 1-chloro-2,2-dimethylpropane.

ii) 1−Bromo−3, 3−dimethyl−1−phenylbutane .

iii) 3−Chloro−5−methylhex−2− ene .

iv) 1−Bromo−1−chloro−1, 2, 2−trifluoroethane .

v) 4-Tert-Butyl-3-iodoheptane .

Q.2. What are ambident nucleophiles? Explain with an example

Q.3 Write the formula of major product formed in the following chemical reactions:

(a) CH_3Br + alc. AgCN $\longrightarrow$

(b) $CH_3CH_2CH(Cl)CH_3$ + Na $\longrightarrow$

(c) C_6H_6 + Br $\xrightarrow{Cl_2/FeCl_3}$

(d) $(CH_3)_2$ CH-C1 $\xrightarrow{Na}$

(f) CH_3CH_2Br + Nal $\xrightarrow{dry\ ether}$

Q.4. Answer the following :

(i) Haloalkanes easily dissolve in organic solvents, why?

(ii) What is known as a racemic mixture? Give an example.

(iii)Explain why the boiling points of isomeric haloalkanes decrease with increase in branching.

Q.5 . Illustrate the following reactions giving a suitable chemical equation for each:

(i) Sandmeyer's reaction

(ii) Wurtz – Fittig reaction

(iii) Finkelstein reaction

(iii) Friedel - Crafts reaction

(iii) Fittig reaction

Q.6 Rearrange the compounds of each of the following sets in order of reactivity towards SN_2 displacement:

(i) 2-Brom-2-methylbutane, 1-Bromopentane, 2-Bromopentane

(ii) 1-Brom-3-methylbutane, 2-Bromo-2-methylbutane, 3-bromo-2-methylbutane

(iii) l-Bromobutane, 1-Bromo-2,2-dimethylpropane, 1-Bromo-2-methylbutane

Q.7How may methyl bromide be preferentially converted to methyl cyanide and methyl isocyanide?

Q.8 **(i)** State one use each of **DDT** and **Iodoform**.

(ii) Which compound in the following pairs will react faster in S_N2 displacement and why? **(a)** 1-Bromopentane or 2-Bromopentane

(b) 2-Bromo-2 methyl butane or 1-bromo-2methyl butane

Q.9 How will you bring about the following conversions?

i) Toluene to benzyl alcohol

iii) Chlorobenzene to p-nitrophenol

iv) Benzene to 4- Bromo nitrobenzene

v) Aniline to chlorobenzene

Q.10 What happens when

i. n-butyl chloride is treated with alcoholic KOH,

ii. bromobenzene is treated with Mg in the presence of dry ether,

iii. chlorobenzene is subjected to hydrolysis,

iv. ethyl chloride is treated with aqueous KOH,

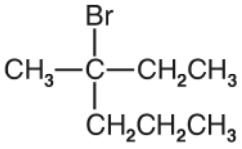
v. methyl bromide is treated with sodium in the presence of dry ether,

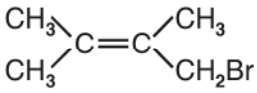
vi. Methyl chloride is treated with KCN.

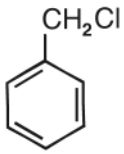
Chapter - 10

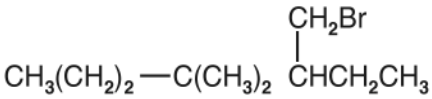
HALOALKANES AND HALOARENES

1. Write the IUPAC names of the following compounds.

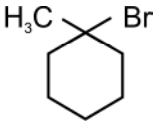
(i) 

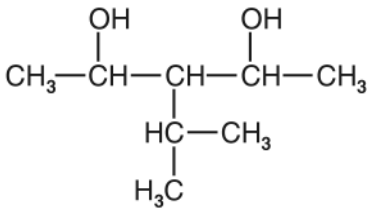
(ii) 

(iii) 

(iv) 

(v) $CH_2Br - CH = CH - CH_2 - C \equiv CH$

(vi) 

(vii) 

(ix) $(CCl_3)_3\ CCl$

2. Write the structure of following halogen compounds

(i) 2-chloro-3-methylpentane

(ii) 2-(2-chlorophenyl)-1-iodooctane

(iii) 1-bromo-4-sec-butyl-2–methylebenzene.

(iv) p-bromotoluene.

(v) chlorophenylmethane

3. Arrange the following in the increasing order of properly indicated :

(i) bromomethane, chloromethane, dichloromethane. (Increasing order of boiling points).

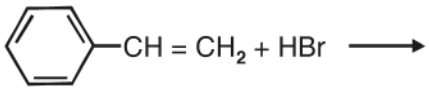
(ii) 1-chloropropane, isopropyl chloride, 1-chlorobutane (Increasing order of boiling point)

(iii) dichloromethane, chloroform, carbon terachloride. (Increasing order of dipole moment.

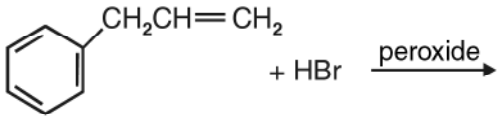
(iv) CH_3F, CH_3Cl, CH_3Br, CH_3I (Increasing reactivity towards nucleophilic substitution and increasing order of dipole moment)

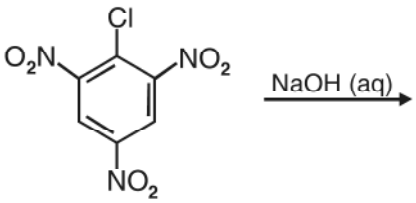
(v) *o,m.p*-dichlorobenzenes (Increasing order of melting points).

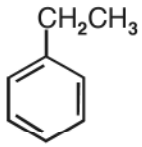
4. Complete the following reactions :

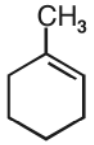
(i) 

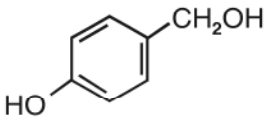
(ii) $CH_3 - CH_2 - Cl + Ag\ NO_2 \longrightarrow$

(iii) 

(iv) 

(v)  $\xrightarrow[uv\ \text{light}]{Br_2/\text{heat}}$

(vi)  $+ HI \longrightarrow$

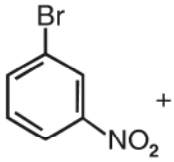
(vii)  $+ SOCl_2 \longrightarrow$

(viii) $CH_3CH_2Br + NaI \xrightarrow{\text{acetone}}$

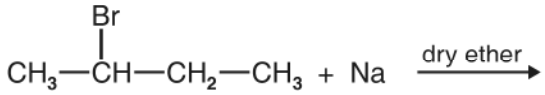
(ix)  $+ Br_2 \xrightarrow{UV\ \text{light}}$

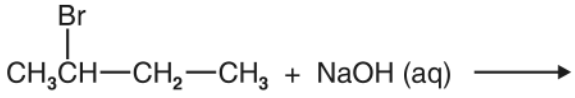
(x) $(CH_3)_3\ CBr + KOH \xrightarrow[\text{heat}]{\text{ethanol}}$

(xi) $CH_3CH_2Br + KCN \xrightarrow{aq.\ EtOH}$

(xii)  $+ Mg \xrightarrow[\text{Ether}]{\text{dry}}$

(xiii) $C_6H_5ONa + C_2H_5Cl \longrightarrow$

(xiv) 

(xv) 

(xvi) $C_6H_5N_2^+Cl^- + KI \longrightarrow$

5. How will you bring about the following conversions?

(i) benzene to 3-bromonitrobenzene

(ii) ethanol to but-1-yne

(iii) 1-bromopropane to 2-bromopropane

(iv) benzene to 4-bromo-1-nitrobenzene

(v) aniline to chlorobenzene

(vi) 2-methyl-1-propene to 2-chloro-2-methylpropane

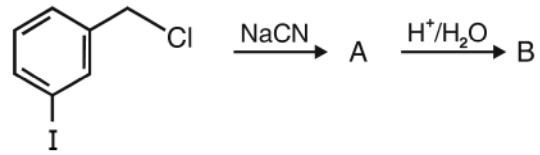
(vii) ethyl chloride to propanoic acid

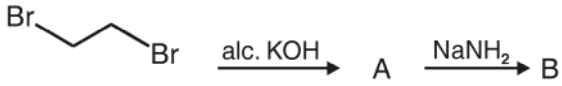
(viii) but-1-ene to n-butyl iodide

(ix) benzene to phenylchloromethane.

(x) tert-butyl bromide to isobutyl bromide.

6. Identify the products formed in the following sequence :

(i) 

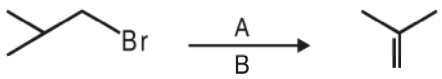
(ii) 

(iii) $C_6H_5CH_2CHBrCH_3 \xrightarrow{\text{alc. KOH}} A \xrightarrow{HBr} B$

(iv) $CH_3CH(Br)-CH_3 \xrightarrow{\text{alc. KOH}} X \xrightarrow[H_2O_2]{HBr} Y$

(v) $CH_3CH_2CH = CH_2 + Br_2 \xrightarrow{CCl_4} A$

(vi) $CH_3CH_2CH = CH_2 + Br_2 \xrightarrow[UV \text{ light}]{\text{heat}} B$

(vii) 

(viii) $CH_3Br \xrightarrow{KCN} A \xrightarrow{H_3O^+} \xrightarrow[ether]{Li\,Al\,H_4}$

7. Explain the following reactions with suitable example :

   (i) Finkelstein reaction.

   (ii) Swarts reaction.

   (iii) Wurtz reaction.

   (iv) Wurtz-Fitting reaction

   (v) Friedel-Craft's alkylation reaction.

   (vi) Friedel-Craft's acylation reaction

   (vii) Sandmeyer reaction.

8. Write the major products and name the rule responsible for the formation of the product.

   (i) $CH_3—CH_2—\underset{\displaystyle Br}{\underset{|}{CH}}—CH_3 \xrightarrow[EtOH]{KOH}$

   (ii) $CH_3—CH_2—CH = CH_2 + HBr \xrightarrow[peroxide]{organic}$

9. Write the difference between

   (i) enantiomers and diastereomers

   (ii) retention and inversion of configuration.

   (iii) electrophilic and nucleophilic substitution reactions.

10. Give a chemical test to distinguish between the following pairs of compounds:

   (i) chlorobenzene and cyclohexylchloride.

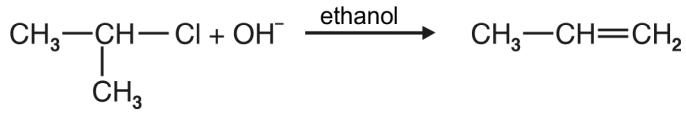
   (ii) vinyl chloride and ethyl chloride.

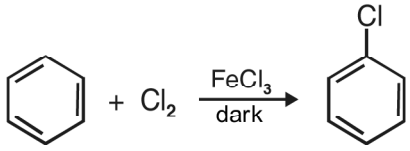
   (iii) n-propyl bromide and isopropyl bromide.

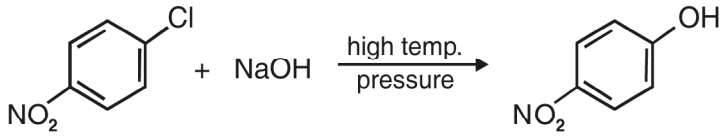
11. Give mechanism of the following reactions :

   (i) $(CH_3)_3C - Cl + \bar{O}H \longrightarrow (CH_3)_3\ C - OH$

   (ii) $CH_3 - Cl + OH^- \longrightarrow CH_3 - OH$

(iii) 

(iv) 

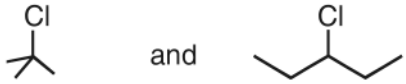
(v) 

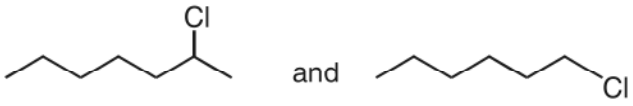
12. Which compound in each of the following pairs will react faster in S_N2 reaction with OH^- and why?

    (i) CH_3Br or CH_3I

    (ii) $(CH_3)_3$ CCl or CH_3Cl

13. In the following pairs which halogen compound undergoes faster SN1 reaction?

    (i) 

    (ii) 

    (iii) $(CH_3)_3C$ – Cl and $C_6H_5CH_2Cl$

    (iv) $C_6H_5CH_2Cl$ and $C_6H_5C(Cl)C_6H_5$

    (v) CH_2 = CH – Cl and CH_2 = CH – CH_2Cl

14. Give reasons for the following :

    (i) The bond length of C–Cl bond is larger in haloalkanes than that in haloarenes.

    (ii) Although alkyl halides are polar in nature but are not soluble in water.

(iii) tert-butyl bromide has lower boiling point than n-Butyl bromide.

(iv) haloalkanes react with KCN to form alkyl cyanide as main product while with AgCN alkyl isocyanide is the main product.

(v) sulphuric acid is not used in the reaction of alcohol with KI.

(vi) thionyl chloride is the preferred reagent for converting ethanol to chloroethane.

(vii) haloalkanes undergo nucleophilic substitution reaction easily but haloarenes do not undergo nucleophilic substitution under ordinary conditions.

(viii) chlorobenzene on reaction with fuming sulphuric acid gives ortho and para chlorosulphonic acids.

(ix) 2, 4-dinitro chlorobenzene is much more reactive than chlorobenzene towards hydrolysis reaction with NaOH.

(x) Grignard reagent should be prepared under anhydrous conditions.

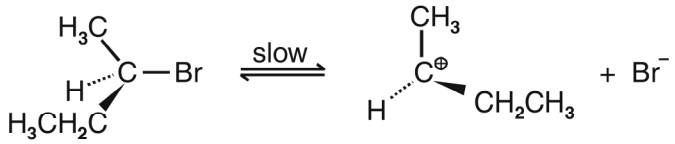
(xi) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride.

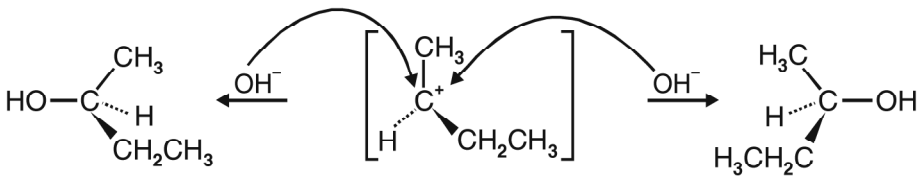
(xii) neopentyl bromide undergoes nucleophilic substitution reactions very slowly

(xiii) vinyl chloride is unreactive in nucleophilic substitution reaction.

(xiv) An optically inactive product is obtained after the hydrolysis of optically active 2- bromobutane.

[**Hint :** The hydrolysis reaction occurs by S_N1 pathway. The carbocation is formed first which gives a mixture of (±) butan-2-ol in the second step].

I. 

II. 

(xv) methyl iodide is hydrolysed at faster rate than methyl chloride.

15. Write the different products and their number formed by the monochlorination of following compounds :

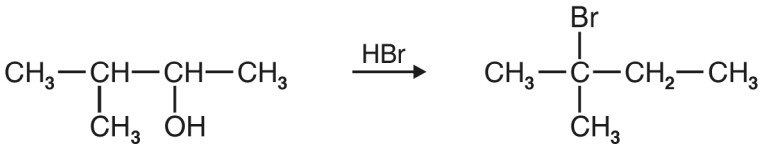
(i) $CH_3CH_2CH_2CH_3$

(ii) $(CH_3)_2CHCH_2CH_3$

(iii) $(CH_3)_2CHCH(CH_3)_2$

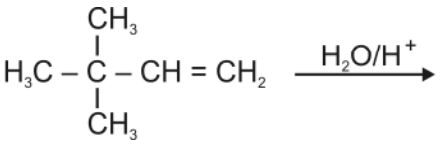
[**Hint :** (i) Two, (ii) four, (iii) three

16. (a) When 3-methylbutan-2-ol is treated with HBr, the following reaction takes places :

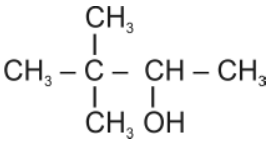


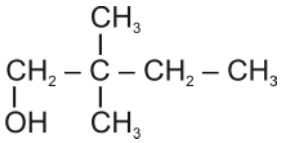
Give the mechanism for this reaction.

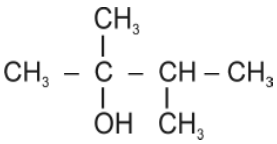
(b) In the following reaction :

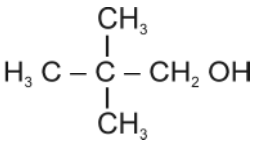


major and minor products are :

(i) 

(ii) 

(iii) 

(iv) 

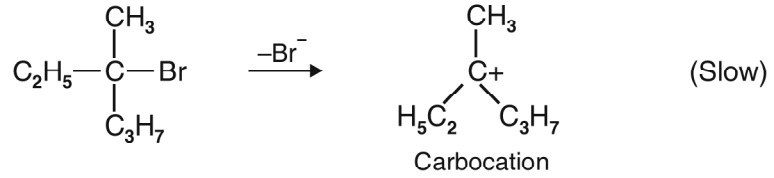
Ans. Major (iii) minor (i)

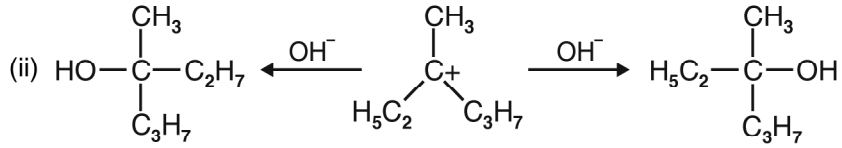
17. Give one use of each of following :

(i) Freon-12 (ii) DDT

(iii) Carbon tetrachloride (iv) Iodoform

18. An optically active compound having molecular formula $C_7H_{15}Br$ reacts with aqueous KOH to give $C_7H_{15}OH$, which is optically inactive. Give mechanism for the reaction.

[**Ans. :** (i) 

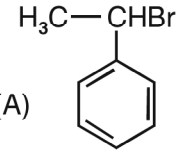
(ii) 

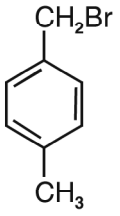
product with inversion of configuration

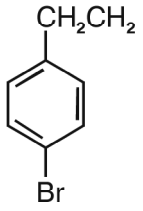
product having retention of configuration

A racemic mixture is obtained which is optically inactive.]

19. An organic compound C_8H_9Br has three isomers A, B and C. A is optically active. Both A and B gave the white precipitate when warmed with alcoholic $AgNO_3$ solution in alkaline medium. Benzoic acid, terephthalic and p-bromobenzoic acid were obtained on oxidation of A, B and C respectively. Identify A, B and C.

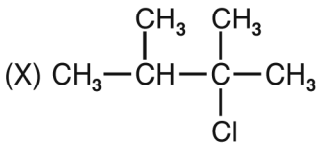
[**Ans. :** (A) 

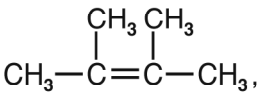
(B) 

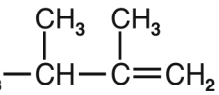
(C) 

*20. An alkyl halide X having molecular formula $C_6H_{13}Cl$ on treatment with potassium tert-butoxide gives two isomeric alkenes Y and Z but alkene y is symetrical. Both alkenes on hydrogenation give 2, 3-dimethylbutane. Identify X, Y and Z.

[**Ans.**

(X) 

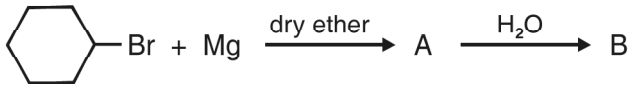
, (Y) 

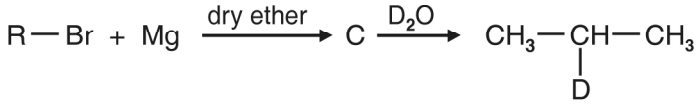
, (Z) 

*21. An organic compound (A) having molecular formula C_3H_7Cl on reaction with alcoholic solution of KCN gives compound B. The compound B on hydrolysis with dilute HCl gives compound C. C on reduction with H_2/ Ni gives 1-aminobutane. Identify A, B and C.

[**Ans. :** (A) $CH_3CH_2CH_2Cl$, (B) $CH_3CH_2CH_2CN$, (C) $CH_3CH_2CH_2CONH_2$

*22. Identify A, B, C, D, E, R and R´ in the following sequence of reactions :

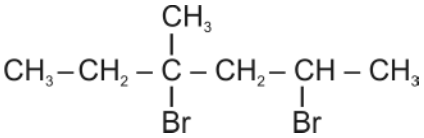
(a) 

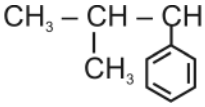
(b) 

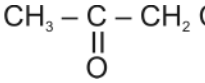
(c) 

23. Which nomenclature is not according to IUPAC system.

(i) Br – CH_2 CH = CH_2; 1–bromoprop-2-ene

(ii)  4–bromo-2, 4-dimethylhexane

(iii)  2–methyl–3–phenylpentane

(iv)  5–oxohexanoic acid

BIOLOGY

i) INVESTIGATORY PROJECT (FOR CBSE EXAMINATION 2025-2026)

Guidelines:-

- Select any one of the topics from the mentioned list of projects.
- Do internet research and watch youtube videos on relevant topic.
- Prepare a file on A4 sheet on the selected topic.
- First page has to carry the information like – project name, subject name, session.
- Starting from first page to concluding page, every related information should be presented in order.
- Investigatory project must be supported with relevant pictures of the experiments performed (wherever required)
- Bibliography to be included.

Few suggested topics:

a) Applications of Microorganisms in Industrial Microbiology
b) CRISPR – The New Technology in Genetic Editing
c) Integration of Computer Science – Bioinformatics and Computational Biology
d) Discussing the Role of Genes in Driving Evolutionary Change
e) Various Diseases that Can Happen from Protein Folding and Misfolding
f) Exploring the role of epigenetics in the development of cancer.
g) Studying the genetic basis of drug resistance in bacteria and exploring strategies to overcome it.
h) Investigating the impact of pesticides on pollinator populations and ecosystem health
i) Investigating the effects of intermittent fasting on metabolism and aging.
j) Investigating the molecular mechanisms of neurodegenerative diseases, such as Alzheimer's and Parkinson's.
k) Antibiotic Resistance and its Implications
l) Epidemiological Analysis of COVID-19 Outbreaks
m) Investigatory project on Abortion in India

Note: Any other investigatory project, which involves about 10 periods of work, can be chosen with the approval of teacher.

ii) INTERNSHIP

Duration: 10 Days

Guideline-Students can do their internship at any nearby plant nursery, local dispensery, pathology labs etc.

Prepare an internship report.

(The report must include introduction of the organisation, duration of internship, Objectives, Responsibilities and tasks, Challenges and problem solving, skills developed and conclusion)

iii)WORKSHEET

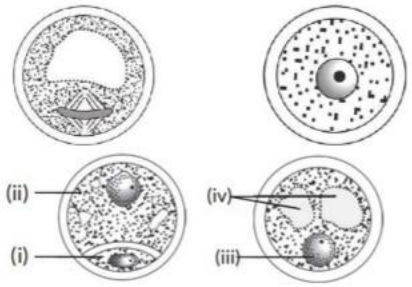
CHAPTER: SEXUAL REPRODUCTION IN PLANTS

MULTIPLE CHOICE QUESTIONS

i- A group of compactly arranged homogenous mass of cells occupying the centre of a typical microsporangium in an anther is

a) sporogenous tissue. b) pollen sacs. c) microspore tetrad. d)Spores

ii- The figures of the developmental stage of a microspore into a mature pollen grain are given below. Choose the option showing the correct labellings for (i), (ii), (iii) and (iv).



iii- Choose the correct statement from the following-

	(i)	(ii)	(iii)	(iv)
(a)	Generative cell	Vegetative cell	Male gametes	Vacuoles
(b)	Vegetative cell	Generative cell	Vacuoles	Male gametes
(c)	Generative cell	Vegetative cell	Nucleus	Vacuoles
(d)	Vegetative cell	Generative cell	Vacuoles	Nucleus

a) Cleistogamous flowers always exhibit autogamy

b) Chasmogamous flowers always exhibit geitonogamy

c) Cleistogamous flowers exhibit both autogamy and geitonogamy

d) Chasmogamous flowers never exhibit autogamy

iv- In a flower, if the megaspore mother cell forms megaspores without undergoing meiosis and if one of the megaspores develops into an embryo sac, its nuclei would be-

a) haploid. b) diploid. c) Any megaspore. d) Micropylar megaspore

v- Milky water in green coconut is

a) Free nuclear Liquid endosperm. b) Liquid nucleus

c) middle megaspore. d) a few haploid and a few diploid

vi- While planning for an artificial hybridization programme involving dioecious plants, which of the following is not relevant-

a) Bagging of female flower b) Dusting of pollen on stigma

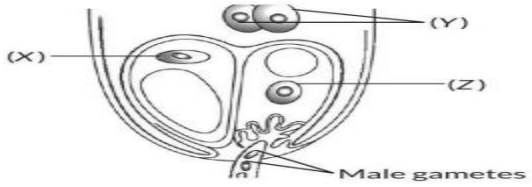
c) Emasculation d) Collection of pollen.

vii-In the embryos of a typical dicot and a grass, true homologous structures are-

a) Coleorhiza and coleoptile b) Coleoptile and scutellum

c) Cotyledons and scutellum d) Hypocotyl and radicle

viii- The given figure of an egg apparatus of an angiosperm shows the entry of pollen tube for releasing the two male gametes. Which of the two from ' X ', ' Y ' and ' Z ', the two male gametes fuse with?



(a) X and Z (b) X and Y (c) Y and Z (d) Z and Z

ASSERTION REASON BASED QUESTIONS

Directions: In the following questions, a statement of assertion is followed by a Statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

i. **Assertion:** Gynoecium consists of pistil.
Reason: It represents the male reproductive part in flowering plants.
ii. **Assertion:** Flowers are the structures related to sexual reproduction in flowering plants.
Reason: Various embryological processes of plants occur in a flower.
iii. **Assertion:** A typical microsporangium of angiosperms is generally surrounded by four wall layers.
Reason: The outer three wall layers perform the function of protection and help in dehiscence of anther to release the pollen.
iv. **Assertion:** An angiospermous flower represents the modified condensed shoot which performs the function of sexual reproduction.
Reason: The fertile leaves of the shoot become modified into microsporophylls and magasporophylls which bear ovules and anthers respectively.
v. **Assertion:** Hydrophily is a major mode of pollination in most of the aquatic plants in angiosperms.
Reason: Almost all the aquatic dicot and monocot plants require water for the transport of male gametes and for fertilisation.

VERY SHORT AND SHORT ANSWER TYPE QUESTIONS

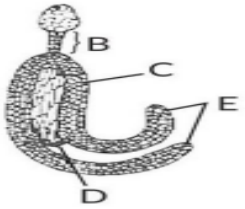
i. Give an example of a plant which came into India as a contaminant and is a cause of pollen allergy.
ii. (a) Explain the process of the development of a male gametophyte in an angiosperm.
(b) Why is it called a male gametophyte?
iii. A pollen grain in angiosperm at the time of dehiscence from an anther could be 2-celled or 3- celled. Explain. How are the cells placed within the pollen grain when shed at a 2-celled stage?

iv. Name the organic materials exine and intine of an angiosperm pollen grain are made up of. Explain the role of intine.

v. Name the parts of the flower which the tassels of corn cob represent.

vi. Write the difference between the tender coconut water and the thick white kernel of a mature coconut and their ploidy.

vii. (a) Identify the figure given below and also identify the parts B, C, D and E.



(b) State the function of E.

viii. Emasculation and bagging are the two important steps carried during artificial hybridisation to obtain superior varieties of desired plants. Explain giving reasons, in which types of flowers and at what stages are the two processes carried out.

LONG ANSWER TYPE QUESTIONS

i. Angiosperm flowers may be monoecious, cleistogamous or show self-incompatibility. Describe the characteristic features of each one of them and state which one of these flowers promotes inbreeding and outbreeding respectively.

ii. A flower of brinjal plant following the process of sexual reproduction produces 360 viable seeds. Answer the following questions giving reasons:

(a) How many ovules are minimally involved?

(b) How many megaspore mother cells are involved?

(c) What is the minimum number of pollen grains that must land on stigma for pollination?

(d) How many male gametes are involved in the above case?

(e) How many microspore mother cells must have undergone reduction division prior to dehiscence of anther in the above case?

iii. (a) When a seed of an orange is squeezed, many embryos, instead of one are observed. Explain how it is possible.

(b) Are these embryos genetically similar or different? Comment

WORKSHEET-2

CHAPTER- HUMAN REPRODUCTION

MULTIPLE CHOICE QUESTIONS

i- Ovulation in the human female normally takes place during the menstrual cycle

a) At the mind secretory phase

b) just before the end of the secretory phase

c) at the beginning of the proliferative phase

d) at the end of the proliferative phase.

ii- After ovulation Graafian follicle regresses into

a) corpus atresia b) corpus callosum c) corpus luteum d) corpus albicans

iii- Immediately after ovulation, the mammalian egg is covered by a membrane known as

a) chorion b) zona pellucida c) corona radiata d) vitelline membrane.

iv- If mammalian ovum fails to get fertilised, which one of the following is unlikely ?

a) Corpus luteum will distintegrate.

b) Progesterone secretion rapidly declines.

c) Estrogen secretion increases.

d) Primary follicle starts developing.

v- Which part of the sperm plays an important role in penetrating the egg membrane?

a) Allosome b) Tail c) Autosome d) Acrosome

vi-The nutritive cells found in seminiferous tubules are

a) Leydig‘s cells b) atretic follicular cells

c) Sertoli cells d) chromaffin cells.

vii- Sertoli cells are regulated by the pituitary hormone known as

a) LH b) FSH c) GH d) Prolactin

viii- The source organ and function of hormone FSH are-

a) anterior pituitary, corpus luteum formation b)
b) posterior pituitary, Graafian follicle formation

c) anterior pituitary, follicular formation

d) hypothalamus, primary oocyte formation.

ASSERTION REASON BASED QUESTIONS

Directions: In the following questions, a statement of assertion is followed by a Statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

i- **Assertion :** Testicular lobules are the compartments present in testes.
Reason : These lobules are involved in the process of fertilization.

ii- **Assertion:** Testes are located in the scrotum, outside the coelom.
Reason: A vaginal coelom partly surrounds the testes in the scrotum.

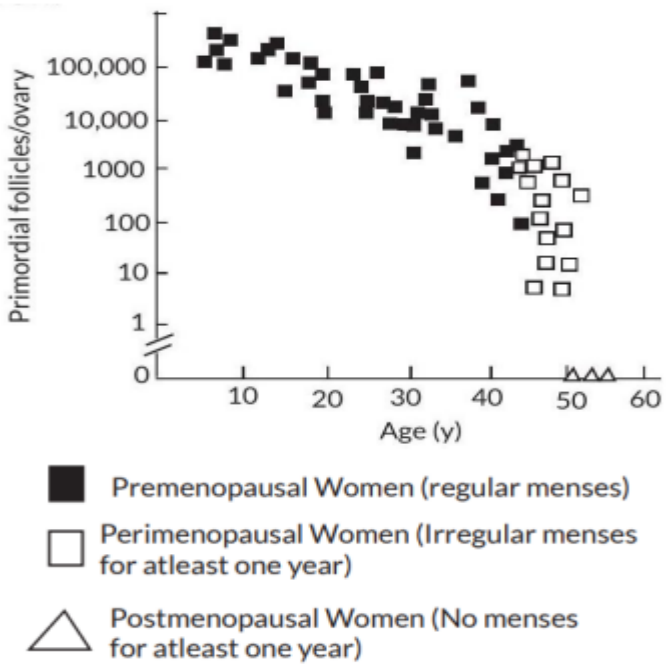
iii- **Assertion:** The female external genitalia includes mons pubis, labia majora and labia minora.
Reason: The glandular tissue of each breast is divided into 5-10 mammary lobes

iv- **Assertion:** Spermatogenesis starts at the age of puberty.
Reason: There is a significant increase in level of gonadotropin releasing hormone at puberty.

v- **Assertion:** Finger-like projections appear on the trophoblast called chorionic villi after implantation.
Reason: Chorionic villi are surrounded by the uterine tissue and maternal blood.

VERY SHORT AND SHORT ANSWER TYPE QUESTIONS

i. The graph given below shows the number of primordial follicles per ovary in women at different ages. Study the graph and answer the questions that follow:



(a) What is the average age of the women at the onset of menopause?
(b) At what age are maximum primordial follicles present in the ovary, according to the given graph?

ii. Explain the events in a normal woman during her menstrual cycle on the following days:

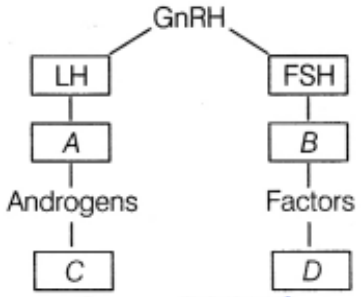
(a) Pituitary hormone levels from 8 to 12 days.
(b) Uterine events from 13 to 15 days.
(c) Ovarian events from 16 to 23 days.

iii. Mention the site of fertilisation of a human ovum. List the events that follow in sequence until the implantation of the blastocyst.

iv. Draw a labelled diagram to show inter-relationship of four accessory ducts in a human male reproductive system.

v. Explain the role of pituitary and sex hormones in the process of spermatogenesis

vi. Identify A, B, C and D with reference to gametogenesis in humans, in the flow chart given below.

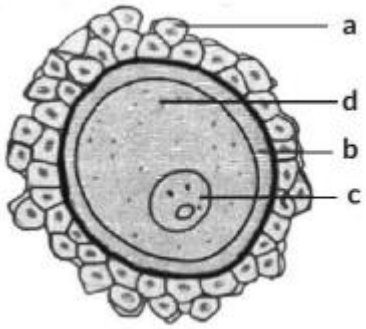


vii. List the three hormones produced in women only during pregnancy. What happens to the levels of estrogen and progesterone during pregnancy?

viii. State from where do the signals for parturition originate in human females.

LONG ANSWER TYPE QUESTIONS

i. Given below is a diagrammatic representation of a human ovum.



(a) Identify the parts 'a', 'b' and ' *c* '.
(b) This ovum is released from the ovary with incomplete meiotic division. When, where and how is the meiotic division completed?
(c) How does an ovum ensure the entry of a single sperm during fertilisation?

ii. (a) Draw a sectional view of a human ovary and label primary follicle, tertiary follicle, Graafian follicle and corpus luteum in it.
(b) Name the gonadotropins and explain their role in oogenesis and the release of ova.

iii. (a) Name the hormone that initiates spermatogenesis in humans. Describe the process of spermatogenesis in sequence mentioning the ploidy of the cells at each step.
(b) Draw the diagram of a mature human sperm and label the parts that
(i) helps it reaching to the ovum
(ii) providing energy for it to reach the ovum.
(iii) helping it to gain entry into the ovum.

WORKSHEET-3

CHAPTER-REPRODUCTIVE HEALTH

MULTIPLE CHOICE QUESTIONS

i- In-vitro fertilization involves transfer of _____ into the fallopian tube.

a) embryo upto eight cell stage b) embryo of thirty two cell stage

c) zygote d) either zygote or embryo up to eight cell stage

ii- Tubectomy is a method of sterilization in which

a) nucleus is removed b) ovaries are removed

c) small part of fallopian tube is removed d) small part of vas deferens is removed

iii- IUDs release copper ion to

a) prevent ovulation b) make uterus unsuitable for implantation.

c)suppress mortility d) increase phagocytosis of sperm

iv-The method of directly injecting a sperm into ovum in Assisted Reproductive Technology is called

a) GIFT b) ZIFT c) ICSI d) ET

v- Increased IMR and decreased MMR in a population will

a) cause rapid increase in growth rate b) result in decline in growth rate

c) not cause significant change in growth rate d) result in an explosive population

vi- Intensely lactating mothers do not generally conceive due to the

a) suppression of gonadotropins b) hyper secretion of gonadotropins

c) suppression of gametic transport d) suppression of fertilisation

vii- Sterilisation techniques are generally fool proof methods of contraception with least side effects. Yet, this is the last option for the couples because

(i) it is almost irreversible

(ii) of the misconception that it will reduce sexual urge

(iii) it is a surgical procedure

(iv) of lack of sufficient facilities in many parts of the country

Choose the correct option.

a) (i) and (iii) b) (ii) and (iii) c) (ii) and (iv) d) (i), (ii), (iii) and (iv)

viii- Which of the following STDs are caused by bacteria?

a) AIDS and Genital Herpes
b) Syphilis and gonorrhoea
c) Trichomoniasis and scabies
d) All of these

ASSERTION REASON BASED QUESTIONS

Directions: In the following questions, a statement of assertion is followed by a

Statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.

i- **Assertion:** Family planning is an action plan to attain reproductive health among people.
Reason: Improved programmes covering reproduction related areas were propagated by RCH to create awareness among people.
ii- **Assertion:** Introduction of sex education in schools should be encouraged.
Reason: This will encourage children to believe in myths about sex related aspects.
iii- **Assertion:** Natality increases both population density and population size.
Reason: Natality increases the number of individuals in an area by births.
iv- **Assertion:** Periodic abstinence is a method in which couples avoid from coitus from day 17 to 27 of menstrual cycle.
Reason: It is a very effective method and 100% sure of birth control.
v- **Assertion:** Reusable contraceptives are not full proof method of contraceptions.
Reason: Diaphragms, cervical caps and vaults are barrier methods which prevent conceptions by blocking entry of sperms through cervix. They are reusable.

VERY SHORT AND SHORT QUESTIONS

i. (a) Mention the problems that are taken care of by Reproduction and Child Health Care Programme.
(b) What is aminocentesis and why there is a statutory ban on it?
ii. Name and explain a surgical contraceptive method that can be adopted by the male partner of a couple.
iii. (a) Explain the mode of action of Cu releasing IUDs as a good contraceptive. How is hormone releasing IUD different from it?
(b) Why is 'Saheli' a preferred contraceptive by women (any two reasons)?
iv. Suggest the aspects of reproductive health which need to be given special attention in the present scenario.
v. Suggest some methods to assist infertile couples to have children.
vi. "Intra-Cytoplasmic Sperm Injection" and 'Gamete Intra Fallopian Transfer' are two assisted reproductive technologies. How is one different from other?

LONG ANSWER TYPE QUESTIONS

(a) Explain one application of each one of the following:
(i) Amniocentesis
(ii) Lactational amenorrhea
(iii) ZIFT
(iv) Prepare a poster for the school programme depicting the objectives of : "Reproductive and Child Health Care Programme".

WORKSHEET-4

CHAPTER- PRINCIPLES OF INHERITANCE AND VARIATION

MULTIPLE CHOICE QUESTIONS

i- All genes located on the same chromosome

a) form different groups depending upon their relative distance

b) form one linkage group

c) will not from any linkage groups

d) form interactive groups that affect the phenotype

ii- Conditions of a karyotype 2n + 1, 2n – 1 and 2n + 2, 2n – 2 are called

a) aneuploidy b) polyploidy c) allopolyploidy d) monosomy

iii-Distance between the genes and percentage of recombination shows

a) a direct relationship b) an inverse relationship

c) a parallel relationship d) no relationship

iv- If a plant heterozygous for tallness is selfed, the F2 generation has both tall and dwarf plants. It proves the principle of

a) dominance b) segregation

c) independent assortment d) incomplete dominance

v- In sickle cell anaemia glutamic acid is replaced by valine. Which one of the following triplets codes for valine?

a) G G G b) A A G c) G A A d) G U G

vi- Person having genotype IA IB would show the blood group as AB. This is because of

a) pleiotropy b) Co-dominance c) segregation d) Incomplete dominance

vii- Z Z/ZW type of sex determination is seen in

a) platypus b) snails c) Cockroach d) Peacock

viii- A cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents?

a) TT and Tt b) TT and TT c) Tt and Tt d) Tt and tt

ASSERTION REASON BASED QUESTIONS

Directions: In the following questions, a statement of assertion is followed by a

Statement of reason.
Mark the correct choice as:
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false

i- **Assertion:** Mendel used true-breeding pea lines for artificial pollination experiments for his genetic studies.
Reason: For several generations, a true-breeding line shows the stable trait inheritance and expression.
ii- **Assertion :** Cross of F1 individual with recessive homozygous parent is test cross.
Reason : No recessive individual are obtained in the monohybrid test cross progeny.
iii- **Assertion :** In a monohybrid cross, F1 generation indicate dominant characters.
Reason : Dominance occurs only in heterozygous state.
iv- **Assertion :** In Mirabilis, selfing of F1 pink flower plants produces same phenotypic & genotypic ratio.
Reason : Flower colour gene shows incomplete dominance.
v- **Assertion:** A good example of multiple alleles is ABO blood group system.
Reason: When IA and IB alleles are present together in ABO blood group system, they both express their own types.
vi- **Assertion:** Gametes receives only one allele of a gene.
Reason: During gamete formation, mitosis takes place leads to formation of haploid cells.

VERY SHORT AND SHORT QUESTIONS

i. British geneticist RC Punnett developed a graphical representation of a genetic cross called 'Punnett Square'. Mention the possible result this representation predicts of the genetic cross carried.
ii. Name the type of cross that would help to find the genotype of a pea plant bearing violet flowers.
iii. A geneticist interested in studying variations and patterns of inheritance in living beings prefers to choose organisms for experiments with shorter life cycle. Provide a reason.
iv. Name the stage of cell division where segregation of an independent pair of chromosomes occurs.
v. Differentiate between pleiotropy and polygenic inheritance with suitable examples.
vi. Why did TH Morgan select Drosophila melanogaster to study sex-linked genes for his lab experiments
vii. Name one autosomal dominant and one autosomal recessive Mendelian disorder in humans

LONG QUESTIONS

i. It is sometimes observed that the *F*1 progeny has a phenotype that does not resemble either of the two parents and has intermediate phenotype. Explain by taking a suitable example and working out the cross upto F2 progeny.
ii. (a) What is polygenic inheritance? Explain with the help of a suitable example.
(b) How are pleiotropic inheritance different from polygenic pattern of inheritance?
iii. (a) Why are colourblindness and thalassemia categorised as Mendelian disorders? Write the symptoms of these diseases seen in people suffering from them.
A(b) About 8% of human male population suffers from colourblindness whereas only about 0.4% of human female population suffers from this disease. Write an explanation to show how it is possible.

MATHEMATICS

Relation and functions Exercise 1.1 Q-7, 8, 11, 12, 13, 14
Inverse trigonometry Exercise 2.1 complete Exercise 2.2 complete

COMPUTER SCIENCE

1.What's the output of print("Hello"[1:3])?

2. What's the output of x = 5; print(x * 2)?

3. What's the output of print([1, 2, 3][1])?

4. What's the output of "Hello".upper()?

5. What's the output of "Hello World".split()?

6. What's the output of "Hello".replace("H", "J")?

7. What's the output of [1, 2, 3] + [4, 5, 6]?

8. What's the output of x = [1, 2, 3]; x.append(4); print(x)?

9. What's the output of [1, 2, 3] * 2?

10. What's the output of x = 5; print("Greater" if x > 3 else "Lesser")?

11. What's the output of x = 5; y = 3; print("Equal" if x == y else "Not Equal")?

12. What's the output of for i in range(3): print(i)?

13. What's the output of x = [1, 2, 3]; for i in x: print(i)?

14. What's the output of def greet(name): print("Hello, " + name); greet("John")?

15. What's the output of def add(x, y): return x + y; print(add(2, 3))?

16. What's the output of x = [1, 2, 3]; y = x; y.append(4); print(x)?

17. What's the output of x = {"name": "John", "age": 30}; print(x["name"])?

18. What's the output of x = (1, 2, 3); print(x[1])?

19. What's the output of x = [1, 2, 3]; print(x[::-1])?

20. What is the syntax to print "Hello World" in Python?

21. How do you comment a line in Python? What is the purpose of indentation in Python?

22. What is the difference between static and dynamic typing in Python?

23. How do you declare a variable in Python?

24. What are the basic data types in Python?

25. What is the difference between / and // operators in Python?

26. How do you use the comparison operators in Python?

27. What is the purpose of logical operators in Python?

28. Write a Python program to check if a number is positive or negative using if-else statement.

29. How do you use elif statement in Python?

30. What is the syntax for a for

WORKSHEET ON COMPUTER NETWORKING

1. Be Happy Corporation has set up its new centre at Noida, Uttar Pradesh for its office and web-based activities. It has 4 blocks of buildings.The distance between the various blocks is as follows:

A to B 40 m

B to C 120 m

C to D 100 m

A to D 170 m

B to D 150m

A to C 70 m

Numbers of computers in each block

Block A 25

Block B 50

Block C 125

Block D 10

(a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Noida centre for connecting the digital devices.

(b) Suggest the placement of the following device with justification- Hub/Switch

(c) Which kind of network (PAN/LAN/WAN) will be formed if the Noida office is connected to its head office in Mumbai?

(d) Which fast and very effective wireless transmission medium should preferably be used to connect the head office at Mumbai with the centre at Noida?

2. A company has two offices in different cities. What type of network would you suggest to connect these offices and why?

3. A school wants to share files and printers among its computers. Which type of network would you recommend and why?

4. A company has four buildings in a campus. Suggest a suitable cable layout to connect these buildings.

5. A school has 50 computers in a lab. Which topology would you suggest to connect these computers and why?

6. A company wants to connect its local network to the internet. Which device would you suggest they use and why?

7. A school wants to extend its network to a new building. Which device would you suggest they use to amplify and restore signals?

8. A company wants to send emails to its clients. Which protocol would you suggest they use and why?

9. A school wants to access a remote server. Which protocol would you suggest they use and why? loop in Python?

10. A company wants to protect its network from unauthorized access. Which device would you suggest they use and why?

11. A school wants to ensure secure data transfer over the internet. Which protocol would you suggest they use and why?

12. A company has a network with multiple devices. Suggest a suitable device to manage and forward data packets.

13. A school wants to connect its network to a dissimilar network. Which device would you suggest they use and why?

14. Global Village Enterprises has four buildings in Hyderabad. Suggest a suitable cable layout to connect these buildings.

15. INDIAN PUBLIC SCHOOL in Darjeeling wants to set up a network between its wings. Suggest a suitable device to manage and forward data packets.

16. A company wants to link its head office in Noida to its office in Mumbai. Which transmission medium would you suggest and why?

17. A school wants to connect its computers to the internet. Which device would you suggest they use and why?

18. A company wants to share files and printers among its computers. Which type of network would you recommend and why?

19. A school wants to ensure secure data transfer over the internet. Which protocol would you suggest they use and why?

20. A company wants to protect its network from unauthorized access. Which device would you suggest they use and why?

21. A school wants to access a remote server. Which protocol would you suggest they use and why?

22. Trine Tech Corporation (TTC) is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Hyderabad. As a network adviser, you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned as (i) to (iv) below.

1. What will be the most appropriate block, where TTC should plan to install their server?

2. Draw a block to cable layout to connect all the buildings in the most appropriate manner for efficient communication.

3. What will be the best possible connectivity out of the following, you will suggest to connect the new setup of offices in Bangalore with its London based office:

a) Satellite Link b) Infrared c) Ethernet Cable

4. Which of the following device will be suggested by you to connect each computer in each of the buildings:

a) Switch b) Modem c) Gateway

WORKSHEET ON FUNCTIONS

1. Consider a list:

MyFamily = [“Father”,”Mother”,”Brother”,”Sister”,”Jacky”]

a) write statement to print “Brother”

c) write statement to check “Sister” is in MyFamily or not

d) write statement to update “Jacky” with “Tiger”

e) write statement remove “Jacky” from MyFamily and also print it

f) write statement to add “Tommy” in MyFamily at the end

2. What will be the difference in output

a) for i in range(1,10):

if i % 4 ==0:

break print(i)

b) for i in range(1,10):

if i % 4 == 0:

continue print(i)

3. find the output of the following

```
import random
AR=[20,30,40,50,60,70];
FROM=random.randint(1,3)
TO=random.randint(2,4)
for K in range(FROM,TO+1):
print (AR[K],end=”#“)
```

4. What are the correct ways to generate numbers from 0 to 20

(i) range(20) (ii) range(0,21) (iii) range(21) (iv) range(0,20)

5. Output of following code:

```
A=10 B=15 S=0
while A<=B:
```

S = A + B A = A + 10 B = B + 10 if A>=40:

A = A + 100

print(S)

6. Output of the following code:

X = 17

if X>=17:

X+=10

else:

X-=10

print(X)

7. How many times loop will execute:

P=5 Q=35

while P<=Q:

P+=6

8. Find and write the output of the following python code:

b) write statement to print all items of list in reverse order

(1) Msg="CompuTer" Msg1="

for i in range(0, len(Msg)): if Msg[i].isupper():

Msg1=Msg1+Msg[i].lower() elif i%2==0:

Msg1=Msg1+'*' else:

Msg1=Msg1+Msg[i].upper()

print(Msg1)

(2) A=10 B=10

print(A == B) = ?

print(id(A) == id(B)= ?

print(A is B) = ?

9. What will be the output of following code:

def Alter(x, y = 10, z=20): sum=x+y+z print(sum)

Alter(10,20,30)

Alter(20,30) Alter(100)

10. What will be the output of following code?

```
def Calculate(A,B,C):
return A*2, B*2, C*2
val = Calculate(10,12,14) print(type(val))
print(val)
```

11. What will be the output of following code?

```
def check():
num=50 print(num)
num=100 print(num) check()
print(num)
```

12. What will be the output of following code?

```
def display(s): l = len(s) m=""
for i in range(0,l):
if s[i].isupper():
m=m+s[i].lower()
elif s[i].isalpha():
m=m+s[i].upper()
elif s[i].isdigit():
m=m+"$"
else:
m=m+"*"
print(m) display("EXAM20@cbse.com")
```

13. What will be the output of following code?

```
def Alter(M,N=50): M = M + N
N = M - N
print(M,"@",N) return M
A=200 B=100
A = Alter(A,B) print(A,"#",B) B = Alter(B) print(A,“@“,B)
```

14. What will be the output of following code?

```
X = 100
def Change(P=10, Q=25): global X
if P%6==0:
```

X+=100

else:

X+=50 Sum=P+Q+X

print(P,'#',Q,'$',Sum) Change()

Change(18,50) Change(30,100)

For practical file:-Need to take printout in a file

1. WAP Read a text file line by line and display each word separated by a #.

2. WAP Read a text file and display the number of vowels/consonants/uppercase/lowercase characters in the file.

3. WAP Remove all the lines that contain the character 'a' in a file and write it to another file.

4. Write a random number generator that generates random numbers between 1 and 6

5. Write a Python function to find the maximum of three numbers.

6. Write a Python function to sum all the numbers in a list. Sample List: (4, 6, 3, 5, 6)

7. Write a Python function to reverse a string. Sample String: "python123" Expected Output: "321nohtyp"

PSYCHOLOGY

Dear Students,

As part of your holiday homework for Class 12, you are required to complete a comprehensive case study. This assignment is designed to enhance your analytical and observational skills through an in-depth study of an individual. The following guidelines provide a structured approach to completing this assignment. Please adhere to the instructions carefully.

Case Study File

Objective: Conduct an in-depth analysis of a person aged 14-18 years who is willing to participate. Ensure their voluntary participation, informed consent, and maintain confidentiality throughout the study.

File Structure:

1. **Index**: Leave this section blank for now.

2. **Introduction** to Case Study File:

- Provide an overview of the case study method.
- Discuss the advantages and disadvantages of this method (3-4 pages).

3. **Precautions Taken**:

- Outline the ethical considerations such as voluntary participation, informed consent, debriefing, sharing results, and maintaining confidentiality. Refer to your Class 11 NCERT Psychology textbook for guidance.

4. **Tools Used for Collecting Data**:

- Observation Method: Explain the process and its significance.
- Interview Method: Describe the method and its advantages.
- Psychological Test: Provide details on the type of test used and its relevance.

Refer to your Class 11 NCERT Psychology textbook for detailed explanations.

5. Reasons for Choosing the Subject:

- Explain why you selected the particular individual for your case study.

6. Rapport Formation:

- Detail the steps taken to build a comfortable relationship with the subject. Mention how you assured them of confidentiality and clarified any queries they had regarding the study.

7. Preliminary Information:

- Collect and present the following details about the subject:
- Name
- Age
- Gender
- Birth Order
- Number of Siblings
- Education
- Locality of Residence
- Religion
- Parental Education and Occupation
- Family Income
- Medical History

8. Introspective Report:

- Include a self-reflection report by the subject.

9. Interviews:

- Subject's Interview: Prepare 15-20 questions to ask the subject. Example questions include:

1. Who is your role model?
2. Do you enjoy the company of your family?
3. What stream have you chosen and why?

4. How often do you go out with your family?
5. Do you enjoy your studies?
6. What kind of entertainment do you like?
7. In what kind of environment do you enjoy the most?
8. What are your hobbies?
9. Are there any restrictions placed on you by your family?
10. Do you feel shy talking to people in a group?
11. Do you share your problems with your family?
12. What is your aim in life?
13. Whom do you trust the most in your family?
14. Would you do something your family objects to?
15. How much time do you spend with your family?
16. Do you trust your friends?
17. What kind of appearance interests you the most?
18. Are you short-tempered?

- Parent Interviews (Mother and Father): Prepare questions similar to those for the subject. Example questions include:

1. Do you trust your son/daughter?
2. Do you force them to do anything they wouldn't want to do?
3. Do you trust their friends?
4. Do you take them out regularly?
5. Do you impose strict rules regarding studies?
6. Do you believe in giving pocket money to your child?
7. Is your child moody?
8. How often do you allow your child to go out with friends?
9. Are you satisfied with the company they keep?
10. What passions do you see in your child?
11. Does your child listen to you?
12. Does your child hesitate in sharing problems with you?
13. Have you allowed your child to drive your vehicle?
14. Do you think a mobile phone is necessary for your child?
15. Are you possessive about your child?
16. What qualities of your child do you like the most?
17. Are you aware of your child's hobbies?
18. What is your child's attitude towards life?

- Friend's Interview: Prepare questions to understand the subject's behavior and relationships with peers. Example questions include:

1. How long have you been friends?
2. How much do you trust them?
3. Do you enjoy their company?
4. Are you proud of your friend?
5. Do you know their likes and dislikes?
6. What are their future aims?
7. How often do you meet?

8. What do you appreciate most about them?
9. Do they have any bad habits (e.g., smoking, drinking)?
10. Do they listen to their parents?
11. What sports do they like?
12. Do they attend parties?
13. Are they satisfied with their pocket money?
14. Do they take studies seriously?
15. Are they ready to face life's challenges?

10. **Interview Analysis:**
- Summarize and analyze the responses from:
- Subject's interview
- Mother's interview
- Father's interview
- Friend's interview

11. **Observation Method:**
- Provide a detailed report of your observations regarding the subject's behavior in different settings (school, with friends, with parents).

Please ensure your case study file is well-organized, detailed, and adheres to the given structure.

Worksheet
Variations in Psychological Attributes

Multiple Choice Questions (MCQs)

1. Capacity to use previous experience imaginatively to take care of novel issues is known as:
   A. Musical Intelligence B. Experiential Intelligence

   C. Interpersonal Intelligence D. Contextual Intelligence

   2. A student is given two tasks: one requires finding a single correct answer, while the other asks for generating multiple unique ideas. Which statement best explains the difference between these two types of tasks?

   A. Creativity tests assess convergent thinking, while intelligence tests assess divergent thinking

   B. Creativity tests are open-ended while intelligence tests have specific answers

   C. Creativity tests assess memory, logical reasoning and accuracy, while intelligence tests assess spontaneity, originality and imagination

   D. Creativity tests focus on assessing general creative thinking abilities, while intelligence tests measure creativity in specific areas

2. In a classroom activity, students are asked to think of as many uses as possible for a common object and also connect unrelated ideas in new ways. Which ability is mainly being assessed?
   A. Memory, logical reasoning, and accuracy

   B. Spontaneity, originality and imagination

   C. Ability to produce a variety of ideas and see new relationships between seemingly unrelated things

D. Ability to find the right solution to the problem

3. The correlation between intelligence test scores of identical twins is
   a. Higher when they are raised together than when they are raised apart

   b. Greater than that for fraternal twins raised together

   c. Lower than that for any other blood relatives

   d. The same whether they are reared together or apart

   Choose the correct option:

   A. a and c only B. b and d only C. a and b only D. a and d only

4. A learner is able to perform basic learning tasks through repetition and forming simple Associations but struggles with complex abstract thinking. According to Jensen's model, which level of intelligence is being demonstrated?

   A. Emotional competence B. Social competence

   C. Cognitive competence D. Associative learning

4. Anamika scores well in exams but struggles to maintain friendships. Which concept explains her difficulty?
   A. IQ B. Emotional Intelligence C. Aptitude D. Creativity

5. A student makes the following statements about intelligence and its theories:
   i. Success in life is only associated with intelligence

   ii. Alfred Binet proposed the two-factor theory

   iii. The information-processing approach views intelligence as a set of cognitive processes

   iv. Talent and giftedness mean the same thing

   Which of the above statements is/are correct?

   A. I, II and III B. Only III C. I and II D. None

6. In certain societies, children are trained to perform tasks quickly, efficiently, and with minimal effort, emphasizing speed and mental manipulation. This reflects which type of intelligence?

   A. Technological B. Emotional C. Integrated D. Contextual

6. An Indian psychologist adapts an existing intelligence scale to suit the cultural context of Indian adults. Who developed the Indian adaptation of the Wechsler Adult Performance Intelligence Scale?
   A. R. Samalingasamy B. Uday Shankar C. Pramila Pathak D. M.C. Joshi

7. Two children: Child A: MA = 12, CA = 10, Child B: MA = 15, CA = 13
   Which is correct?

   A. Child A is more intelligent B. Child B is more intelligent

   C. Both have equal IQ D. Cannot be compared

8. A student learns concepts quickly but fails to apply them in new situations. Which intelligence is weak?

A. Analytical B. Experiential C. Practical D. Emotional

8. A psychologist observes:
Child A excels in abstract reasoning

Child B excels in social understanding

Child C excels in musical composition

Which theory best explains this?

A. Spearman's theory B. Gardner's theory C. PASS model D. Binet's theory

9. A person is good at memorising sequences but poor at understanding relationships. Which PASS component is stronger?

A. Simultaneous B. Successive C. Planning D. Attention

10. A 10-year-old child has been diagnosed with severe intellectual disability. The child can speak only a few words, need continuous supervision, and struggle with basic self-care tasks like dressing and eating. Based on this diagnosis, which IQ range is most likely?
A. 25 to 39 B. 40 to 54 C. 15 to 24 D. 54 to 65

11. Which characteristic is LEAST associated with gifted children?
A.High curiosity B. Rote memorisation

C. Original thinking D. Fast information processing

12. A 12-year-old child has IQ = 90. What is the mental age?

A. 10.8 years B. 11 years C. 9.8 years D. 13.3 years

13. Which conclusion best integrates intelligence, culture, and behaviour?
A. Intelligence is universal and identical across cultures

B. Intelligence is shaped by cultural context and demands

C. Intelligence is purely biological

D. Culture has no influence on intelligence

14. In many Asian and African societies, certain types of intelligence are not given much importance compared to social and practical skills. Which type of intelligence is less valued in such contexts?
A. Integral B. Technological C. Emotional D. Experiential

15. Assertion : Intelligence is best understood only as a single measurable construct.

Reasoning : Information-processing approaches emphasize cognitive processes over structure.

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

16. Urvi improves significantly after receiving enriched learning exposure. This supports

A. Fixed intelligence B. Pure heredity

C. Nature–nurture interaction D. IQ irrelevance

Q1: What is meant by 'individual differences in human functioning'?
Q2: Explain the concept of 'intelligence' as discussed in psychological theories.
Q3: Describe the characteristics of emotionally intelligent persons
Q4: What are special abilities, and how are they measured?
Q5: How can intelligence tests be misused, and what are the implications?
Worksheet needs to be done in your psychology notebook.

PHYSICAL EDUCATION

1. Complete the work of Lesson 3 & Lesson 4 in your registers and learn them.
2. Revise worksheets and notes provided on the class Whatsapp group.
3. Write the following in your Physical Education Lab Manual (Practical File) –

PART A. PHYSICAL FITNESS TEST-
SAI Khelo India Test, Brockport Physical Fitness Test (BPFT)

PART B. GAMES AND SPORTS-
Any one game out of the options below.
Labelled diagram of field, history, Star players, Awards, rules, equipment, etc. Cricket/Football Swimming/Volleyball Badminton/Hockey Basketball/Boxing Kabaddi / Handball Table Tennis/ Chees

PART C. YOGA-
Do practice of any five asana at your home on daily basis.

PART D. ASANAS-
Procedure for asana, benefits and contraindication of any two asana for lifestyle diseases-Diabetes, Obesity, Hypertension, Asthma, Backpain write in your lab manual

4. Make a self-video of explaining any one chapter/one topic with a PowerPoint presentation (PPT) and send it to this mail-id nishantkumar7992@gmail.com. Instructions for making a video –
   a. Use a clear background while shooting the video.
   b. Wear school uniform only.
   c. Voice should be audible.
   d. Duration-2 min.
   e. Video should include school name and logo, your name and class.
   f. Use English language only for explanation.

GENERAL STUDIES SUMMER HOLIDAY PROJECT

Students are required to undertake a project during the summer vacation as part of their General Studies curriculum.
The objective is to encourage research, analysis, and application of concepts studied during the academic year.

General Guidelines:

- Every student is required to select any one topic from the list of projects assigned.
- The entire project should be completed in neat handwriting and presented in a well-organized project file. Students are expected to demonstrate independent research, creativity, and analytical understanding in their work.
- Appropriate supporting material such as pictures, diagrams, tables, charts, and graphs should be added to enhance the presentation.
- All references and study material used for the project should be properly mentioned under Bibliography /Acknowledgement of Sources.

CLASS XII – PROJECT THEMES

1. ARTIFICIAL INTELLIGENCE TECHNOLOGY AND ETHICS
Analyse the influence of modern technology on society with refrence to Artificial Intelligence, Cyber Security, Social Media, Digital Governance or Data Protection. Include ethical concerns and real life examples.

2. ECOLOGY AND SUSTAINABLE DEVELOPMENT Examine an environmental concern such as pollution and Climate change waste management water conservation and renewable energy. Discuss it's imapact and suggest sustainable measures.

3. GOVERNANCE AND DEMOCRATIC INSTITUTIONS Study the functioning of democratic institution in india such as parliament election commission judiciary or media. Support your work with examples and case study and critical observations.

4. INDIA'S ECONOMY : CHALLENGES AND OPPORTUNITIES Explore major economic concerns including inflation, unemployment, digital payments, entrepreneurship or rural development. Include recent data, graphical representation and possible solutions.

Important Note:
* The work should demonstrate originality, creativity and independent thinking.
* Students should focus on quality of content along with presentation.
* Neatness, clarity, and proper organization will be considered during evaluation.
* Submission schedule will be shared after the summer vacations.