DALMIA VIDYA MANDIR
RAJGANGPUR
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100 YEARS OF EXCELLENCE

Dalmia Vidya Mandir, Chirawa

2024-25
SUMMER FUN WORK

CLASS
XII SC

DALMIA VIDYA MANDIR, RAJGANGPUR
(56 years of excellence)
(A CBSE English Medium Senior Secondary School, Affiliation No-1530001)
Ph. No. 06624-220321, Extn. 6355, Mob.No. 7381935536, E-Mail: dvm@dvmrajgangpur.edu.in,
Website : www.dvmrajgangpur.edu.in

Dear Parents,

Warm greetings from Dalmia Vidya Mandir!

We trust this letter finds you and your family in good health. As the summer break nears, we're delighted to share that our dedicated team, under the guidance of the Principal and Dr. Rosetta Williams (CEO, DVM group of schools), has curated summer assignments for your child.

These assignments, covering all subjects, aim to keep your child engaged in learning and prepare them for the upcoming academic year. They offer opportunities for exploration, skill development, and maintaining a learning routine during the break.

Your support in ensuring your child completes and submits these assignments to the respective class teacher on the first day of school reopening after the break is greatly appreciated. It will contribute to a positive start to the academic year and reinforce the knowledge acquired during the break.

For any queries or concerns, please reach out to the class teachers. Thank you for your ongoing support and involvement in your child's education. We eagerly anticipate a productive and successful academic year ahead.

Educationally yours,
Principal & Team
DVM, Rajgangpur

INDEX

ENGLISH

1.   Hand washing is as essential as eating food. It is the best way to be healthy and to stay away from various diseases. Soap plays an important role in removing dust, microbes and lubrication, maintaining good health every day. In comparison to the hand sanitizer, soap and water are more efficacious in removing certain microbes, pesticides and other chemical residues that dawdle on hands.

2. Hand sanitizers are more effective in hospitals when hands are in contact with germs, but not soiled or greasy. Other studies also reveal that hand sanitizers might be effective on lubricated hands with certain microbes. When hands are heavily soiled or greasy, for example, after playing outdoor games, gardening, fishing, travelling, executing extension activities such as campaigning and in certain cases, hand sanitizers may not be effective. In such circumstances, washing hands with soap and water is always preferable. Sanitizers cannot remove soil, dirt and grease rather they will make hands sticky, attracting more dirt.

3. According to the Center for Disease Control (CDC), hand hygiene encompasses the cleansing of hands by using soap and water, antiseptic hand washes, antiseptic hand rubs such as Alcohol-Based Hand Sanitizers (ABHS), foams or gels, or surgical hand antisepsis. Hand sanitizers as a disinfectant are in more use today because of its ease of availability, lack of water and time and their proven efficacy in lowering microbial load.

4. A review of research works states that limited literature is available in relation to hand sanitizers and washing hands. As COVID-19 has rapidly spread worldwide, panic buying of sanitizers over the coronavirus pandemic has led to stocking up of sanitizer sprays, gels, and so on, without knowing the effect of the sanitizer.

5. According to the World Health Organisation (WHO), an alcohol-based hand sanitizer is "an alcohol-containing preparation (liquid, gel, or foam) designed for application to the hands to inactivate microorganisms and/or temporarily suppress their growth. Such preparations may contain one or more types of alcohol, other active ingredients with excipients, and humectants." In 1966, hand sanitizers came into existence in healthcare facilities and were popularised significantly in early 1990s.

6. Hand sanitizers can be classified as alcohol-based or alcohol-free. Alcohol-based sanitizers comprise between 60 and 95 percent alcohol in the form of ethanol, isopropanol, or n-propanol. Alcohol have tendency to disseminate proteins and counteract certain micro-organisms at this concentration. Alcohol-free products have a property of disinfectants, such as Benzalkonium Chloride (BAC) or on antimicrobial agents, such as triclosan, which is immediate and purposeful. Several sanitizers comprise emollients (e.g.) glycerine that pacify the skin, thickening agents and provide aroma.

Questions

Based on your understanding of the passage, answer the following questions.

(i) "Such preparations may contain one or more types of alcohol ...." Which preparations is the writer discussing in these lines of the passage?

(a) Foams or gels, or surgical hand antisepsis that are only used in hospitals

(b) Glycerine that pacifies the skin, thickening agents, and provides aroma

(c) Non-Alcohol-based sanitizers used to clean dirt and germs from the hands

(d) An alcohol-containing preparation designed for application to the hands to inactivate microorganisms

(ii) Which word in Para-1 means the same as 'a small amount of something that remains after the main part has gone or been taken or used?

(a) efficacious

(b) residues

(c) pesticides

(d) essential

(iii) Select the option that suitably completes the given dialogue as per the context in paragraph - I.

X: Wash your hands before you eat anything.

Y: But washing the hands only with water is not sufficient, (1)………

X: Could I use a sanitizer instead of the soap?

Y: No, (2) ………………..

(a) (1) As it would not properly clean your hands (2) the sanitizer is not so effective

(b) (1) You need a soap to remove germs and dirt (2) the soap is more effective

(c) (1) You need a sanitizer to remove dirt (2) the soap is not so effective

(d) (1) The plain water would harm your body (2) it's not so effective

(iv) As mentioned in the passage what can be the classification of the hand sanitizers?
Ans

(v) Select the option that is correct with reference to the given passage.

(a) Alcohol-based sanitizers comprise between 80 and 95 percent alcohol in the form of ethanol

(b) In 1986, hand sanitizers came into existence in healthcare facilities

(c) Alcohol-Based Hand sanitizers (ABHS) are better than foams and gels

(d) Hand sanitizers might be effective on lubricated hands with certain microbes

(vi) What is the relationship between (1) and (2)?

1. Sanitizers cannot remove soil, dirt, and grease rather they will make hands sticky, attracting more dirt.

2. Hand sanitizers are more effective in hospitals when hands are in contact with germs, but not soiled or greasy.

(a) (2) is the cause of (1)

(b) (1) and (2) are independent of each other

(c) (1) elaborates upon the premise of (2)

(d) (1) sets the stage of (2)

(vii) "In comparison to the hand sanitizer, soap and water are more efficacious in removing certain microbes, pesticides." What does the term 'efficacious' mean in the context of the passage?

(a) Skilful and valid

(b) Dynamic and versed

(c) Productive and effective (d) Futile and vain

(viii) Which of the following options can accurately describe the hand sanitizers?

1. Fumigant and germicide

2. Decontaminant and sterilizer

3. Germicide and musty

4. Cleanser and antihistamine

(a) 1 and 3

(b) 2 and 4

(c) 3 and 4

(d) 1 and 2

(ix) Which quote best summarises the importance of hand sanitization and cleanliness?
(a) One hand washes the other … both hands wash the face –Proverb

(b) Practice good personal hygiene. Wash your hands before you eat. Be aware of good clean water and food sources –James wright

(c) Dirty water does not wash clean –Proverb

(d) We dream of having a clean house–but who actually dreams of doing the cleaning? –Markus Buckingham

(x) Due to spread of COVID-19, What has panic buying of sanitizers resulted into?

Ans –

 Answer the following questions in 30-40 words-
1.What tempted Franz to stay away from school?
Ans –

2. What tempted Franz to stay away from school?
Ans –

3. How is Mukesh different from the other bangle makers of Firozabad?
Ans –

4. "It is his Karam, his destiny," What is Mukesh's family's attitude towards their situation?
Ans –

5. How does Kamala Das try to put away the thoughts of her aging mother?
Ans –

6. What was the poet's childhood fear?

Ans-

7 . How will 'Keeping Quiet' protect our environment?

Ans –

8. Which images in the poem 'Keeping Quiet' show that the poem condemns violence?

Ans –

9. Choose the best option for your answer-

1. which poetic device has been used in' her face ashen like that of a corpse'?

a. personification   b. metaphor   c. repetition   d. simile

2. what is the tone of the poet in the poem' My Mother at sixty six?

a. pensive, helpless, sorrowful   b. happy, contented, satisfied   c. carefree, satisfied, joyous   d. carefree, satisfied, joyous

3. Metaphor has been used in.-

a. as a late winter's noon   b. trees sprinting, the merry children spilling out of their house

c. driving from my parents home   d. she was as old as she looked

10.- Give a brief account of the life and activities of the people like Saheb-e-Alam settled in Seemapuri. ?

Ans

11. Activity/ project- solve at least 5 sample papers during the holidays.

PHYSICS

Chapter 1 – Electric charges and fields

1. Write the direction and SI unit of electric dipole moment.

2. Derive an expression for electric field of dipole at a point situated on the equatorial plane of a dipole.

3. Find the intensity of electric field due to electric dipole on a point at the axis.

4. Write any two basic properties of electric charge.

5. Four equal charges are placed at the corners of a square. If the electric field at the centre of square due to anyone charge is E than what is the intensity of resultant electric field at the centre?

6. If the attraction force between two charges $+5\mu C$ and $-5\mu C$ is 9N. When they are touched with each other and then put back at the same distance then find the force between them.

7. Prove with an example that electrostatic force is stronger compared to gravitational force.

8. How will you show that charge is of two types?

9. Derive an expression for torque acting on a dipole moment P in the presence of a uniform electric field E.

10. Consider three equal charges q are located at the vertices of an equilateral triangle of side a. How much resultant force is exerted on the charge Q at the centre of the triangle?

11. Prove that the force acting due to two charges are equal in magnitude but opposite in direction.

12. The distance between Na+ and Cl-ions in NaCl is 1.28Å. Calculate the electric dipole moment of molecule.

13. What is meant by frictional electricity? Give the brief description of its origin.

14. Prove that electric field intensity of electric dipole at axial line is twice of equatorial line.

15. Electric field decreases when going far from the point charge. This is true for an electric dipole. Does the electric field decreases at the same rate in both the cases?

16. 'Two electric field lines never intersect each other.' Justify.

17. Draw the electric field lines due to a dipole and system of two like charges.

18. State and prove Gauss Theorem in Electrostatics.

19. Define electric flux. Is it a vector or scalar quantity? Write its SI unit.

20. Derive the expressions of electric field due to (i) a uniformly charged infinitely long straight wire, (ii) uniformly charged infinite plane sheet and (iii) uniformly charged a spherical shell by using Gauss Theorem.

Chapter-2 - ELECTROSTATIC POTENTIAL AND CAPACITANCE

1. (a) Calculate the potential at a point P due to a charge of 4×10^{-7} C located 9 cm away.

(b) Hence obtain the work done in bringing a charge of 2×10^{-9} C from infinity to the point P.

Does the answer depend on the path along which the charge is brought?

2. (a) A comb run through one's dry hair attracts small bits of paper. Why?

What happens if the hair is wet or if it is a rainy day? (Remember, a paper does not conduct electricity.)

(b) Ordinary rubber is an insulator. But special rubber tyres of aircraft are made slightly conducting. Why is this necessary?

(c) Vehicles carrying inflammable materials usually have metallic ropes touching the ground during motion. Why?

(d) A bird perches on a bare high power line, and nothing happens to the bird. A man standing

on the ground touches the same line and gets a fatal shock. Why?

3. Two charges 5×10^{-8} C and -3×10^{-8} C are located 16 cm apart. At what point(s) on the line joining the two charges is the electric potential zero? Take the potential at infinity to be zero.

4. A regular hexagon of side 10 cm has a charge 5 μC at each of its vertices. Calculate the potential at the centre of the hexagon.

5. A charge of 8 mC is located at the origin. Calculate the work done in taking a small charge of -2×10^{-9} C from a point P (0, 0, 3 cm) to a point Q (0, 4 cm, 0), via a point R (0, 6 cm, 9 cm).

6. A hollow metal sphere of radius 5 m is charged such that the potential on its surface is 10 V. What is the potential at the centre of the sphere?

7. What is the area of the plates of a 2 Farad parallel plate air capacitor, given that the separation between the plates is 0.5 cm?

8. At a point due to a point charge, the values of electric field and potential are 32 N/C: and 16 J/C respectively. Calculate magnitude of charge and distance of the charge from the point of observation.

9. At a point due to a point charge, the values of electric field and potential are 20 N/C: and 10 J/C respectively. Calculate magnitude of charge and distance of the charge from the point of observation.

10. Three point charges +q,+2q and Q are placed at the three vertices of an equilateral triangle. Find the value of charge Q (in term of q), so that electric potential energy of the system is zero.

NUMERICALS

1. What is the charge acquired by a body when 1 million electrons are transferred to it?

2. An attractive force of 5N is acting between two charges of +2.0 µC & -2.0 µC placed at some distance. If the charges are mutually touched and placed again at the same distance, what will be the new force between them?

3. A charge of +3.0 x 10^{-6} C is 0.25 m away from a charge of -6.0 x 10^{-6} C.

   a. What is the force on the 3.0 x $^{10-6}$ C charge?

   b. What is the force on the -6.0 x $^{10-6}$ C charge?

4. An electric dipole consists of a positive and a negative charge of 4µC each placed at a distance of 5mm. Calculate dipole moment.

5. Three capacitors of capacitances 2µF, 3µF and 4µF are connected in parallel. What is the equivalent capacitance of the combination? Determine charge on each capacitor, if the combination is connected to 100V supply?

6. An electric dipole with dipole moment 4x10^{-9}C-m is aligned at 30^0 with direction of electric field of magnitude 5x10^4N/C. Calculate the magnitude of the torque acting on the dipole.

7. A point charge of 2µC is at the centre of cubic Gaussian surface 9.0 cm in edge. What is the net electric flux through the surface?

8. What is the amount of work done in moving a 200nC charge between two points 5 cm apart on an equipotential surface?

9. How much work must be done to charge a 24 µF capacitor, when the potential difference between the plates is 500 V?

10. What is the equivalent capacity of the network given below?
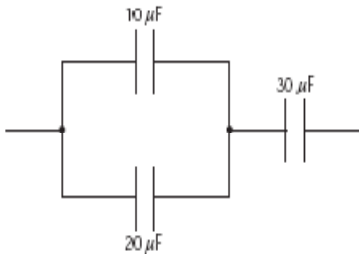
11. What is the work done in moving a charge of 100µC through a distance of 1cm along the equatorial line of dipole?

12. The given graph shows that variation of charge q versus potential difference V for two capacitors C_1 and C_2. The two capacitors have same plate separation but the plate area of C_2 is double than that of C_1. Which of the lines in the graph correspond to C_1 and C_2 and why?
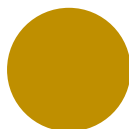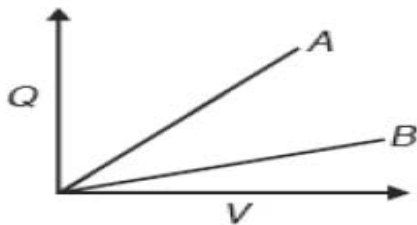
13. Two point charges 5µC and – 4 µC are separated by a distance of 1 m in air. At what point on the line joining the charges is the electric potential zero?

14. Two charges +5µC and +20µC are placed 15 cm apart. At what point on the line joining the two charges is the electric field zero?

15. Two charges +16µC and −9µC are placed 8 cm apart. At what point on the line joining the two charges is the electric field zero?

16. A 600 pF capacitor is charged by a 200 V supply. It is then disconnected and from the supply and is connected to another uncharged 600 pF capacitor. How much electrostatic energy is lost in the process?

17. Keeping the voltage of the charging source constant, what will be the percentage change in the energy stored in a parallel plate capacitor if the separation between its plates were to be decreased by 10%.

18. Four charges are placed at the vertices of a square of side d as shown in the figure.(i) Find the work done to put together this arrangement. (ii) A charge q_0 is brought to the center E of the square, the four charges being held fixed at its corners. How much extra work is needed to do this?
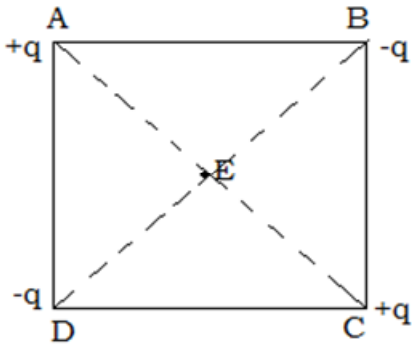
19. If S_1 and S_2 are two hollow spheres enclosing charges Q and 2Q respectively as shown in the figure.

(i) What is the ratio of the electric flux through S_1 and S_2?

(ii) How will the flux through the sphere S_1 change, if a medium of dielectric constant 5 is filled in the space inside S_1.
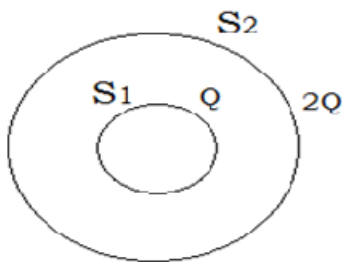
20. A charge of 24µC is given to a hollow sphere of radius 0.2m. Find the potential (i) at the surface of the sphere, and (ii) at a distance of 0.1 m from the centre of the sphere. (iii) at the centre

21. A slab of material of dielectric constant κhas the same area as the plates of a parallel plate capacitor but has a thickness 3d / 4, where d is the separation of the plates. How is the capacitance changed when the slab is inserted between the plates?
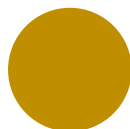
22. A parallel plate capacitor with air between the plates has a capacitance of $8\mu F$. What will be the capacitance if the distance between the plates is doubled and the space between them is filled with a substance of dielectric constant K=6?

23. Two dipoles, made from charges $\pm q$ and $\pm Q$, respectively, have equal dipole moments. Give the (i) ratio between the 'separations' of these two pairs of charges (ii) angle between the dipole axis of these two dipoles.

24. The capacitors C_1 and C_2, having plates of area A each, are connected in series, as shown. Compare the capacitance of this combination with the capacitor C_3, again having plates of area A each, but 'made up' as shown in the figure.
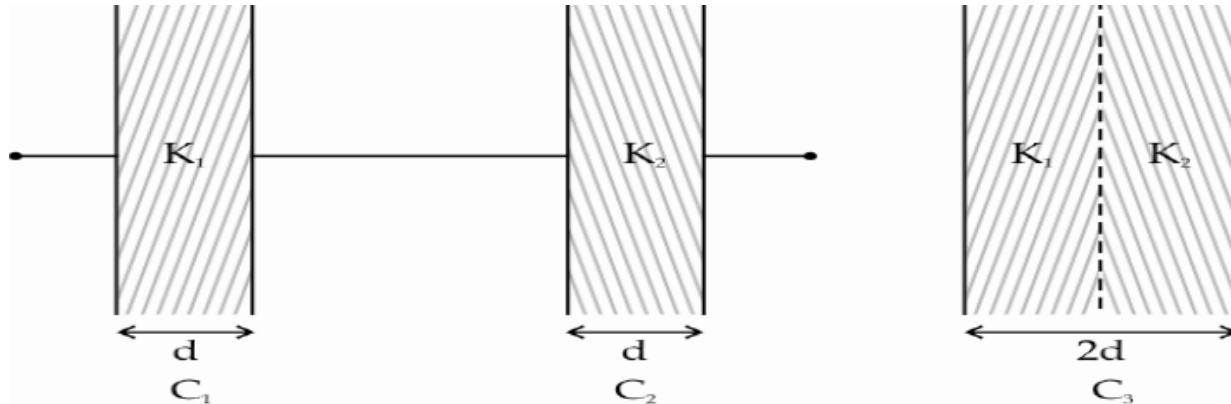
25. Two identical charges, Q each are kept at a distance r from each other. A third charge q is placed on the line joining the two charges such that all the three charges are in equilibrium. What is magnitude, sign and position of the charge q?

26. ABCD is a square of side 5m. Charges of +50C, -50C and +50C are placed at A, C and D respectively. Find the magnitude of resultant electric field at B.

INVESTIGATORY PROJECT

Prepare the Synopsis of an investigatory project consists of any topic of Class XII entire Physics Syllabus.
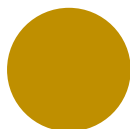
CHEMISTRY

1) Draw the structure of the following organic halogen compounds:

(i) p-bromochlorobenzene

(ii) 1-chloro-4-ethylcyclohexane

2) Draw the structure of the following organic halogen compounds:

(i) 4-tert-butyl-3-iodoheptane

(ii) 4-bromo-3-methylpent-2-ene

3) Write the IUPAC name of the following compounds:

(i) $CH_2=CHCH_2Br$ (ii) $(CCl_3)_3CCl$

4) Which one of the following compounds is more reactive towards S_N2 reaction and why?
$CH_3CH(Cl)CH_2CH_3$ or CH_3CH_2 CH_2Cl

5) (i) Which alkyl halide from the following pair is chiral and undergoes faster towards S$_N$2 reactions?

a) Br   b) Br
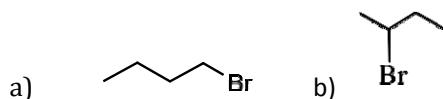
(iii) Out of S$_N$1 and S$_N$2, which reaction occurs with

a)   Inversion of configuration?

b)   Racemisation?

6)   Write chemical equations when
(i)   Ethyl chloride is treated with aqueous KOH.
(ii)   Chlorobenzene is treated with CH$_3$COCl in the presence of anhydrous AlCl$_3$.

7)   (i) Which alkyl halide from the following pair would you expect to react more rapidly by an S$_N$2 mechanism and why?

$$CH_3-CH_2-\underset{\underset{Br}{|}}{CH}-CH_3$$ $$CH_3-CH_2-CH_2-CH_2-Br$$

and
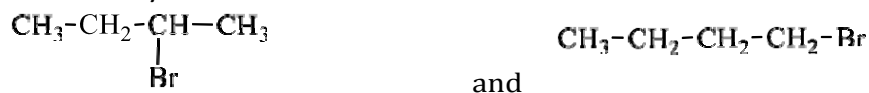
(ii) Racemisation occurs in S$_N$1 reactions. Why?

8)   Which compound in each of the following pairs will react faster towards S$_N$2 reaction with $^-$OH? Why?   (i) CH$_3$Br or CH$_3$I   (ii) (CH$_3$)$_3$CCl or CH$_3$Cl
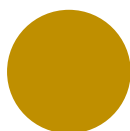
9) Write the chemical equations when,

(i) Methylchloride is treated with $AgNO_2$.

(ii) Bromobenzene is treated with CH_3Cl in the presence of anhydrous $AlCl_3$.

10) What are ambident nucleophiles? Give an example.

11) Account for the following:

(i) The C–Cl bond length in chlorobenzene is shorter than that in CH_3–Cl.

(ii) Chloroform is stored in closed dark brown bottles.

12) Chlorobenzene is extremely less reactive towards a nucleophilic substitution reaction. Give two reasons for the same.

13) Explain why

(i) Alkyl halides, though polar, are immiscible with water?

(ii) Grignard reagent should be prepared under anhydrous conditions?

14) Give the IUPAC name of the following

$$CH_3-CH-CH_2-CH_3$$
$$|$$
$$Br$$
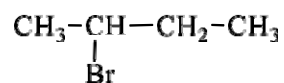
15) Complete the following reactions:

(i)

1-methylcyclohexene + HI $\longrightarrow$

(ii)

styrene (with H, H on double bond) + HBr $\longrightarrow$

$CH_3CH_2CH=CH_2$ + HBr $\longrightarrow$
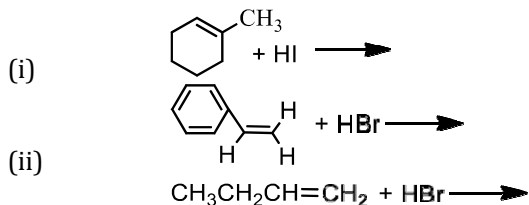
16) (i) Write equation for preparation of 1-iodobutane from 1-chlorobutane.

(ii)   Out of 2-bromopentane, 2-bromo-2-methylbutane and 1-bromopentane,which compound is most reactive towards elimination reaction and why?

17) Give reasons for the following:

(i)   The presence of –NO_2 group at ortho or para position increases the reactivityof haloarenes towards nucleophilic substitution reactions.

(ii)   p-dichlorobenzene has higher melting point than that of ortho or metaisomer.

(iii)   Thionyl chloride method is preferred for preparing alkyl chloride fromalcohols.

18) (i) Out of $(CH_3)_3C–Br$ and $(CH_3)_3C–I$, which one is more reactive towards $S_N1$reaction?

(ii)   Write the product formed when p-nitrochlorobenzene is heated with aqueousNaOH at 443K followed by acidification.

(iii)   Why dextro and laevo-rotatory isomers of butan-2-ol are difficult to separate by fractional distillation?

19) (i) Identify the chiral molecule in the following pair:

a)   and   b)   HO   OH
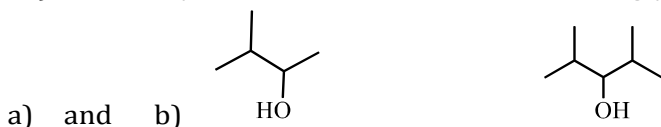
(ii)   Write the structure of the product when chlorobenzene is treated withmethyl chloride in the presence of sodium metal and dry ether.

(iii)   Write the structure of the alkene formed by dehydrohalogenation of 1- bromo-1-methylcyclohexane with alcoholic KOH.

20) Write the product(s) formed when
(i)   2-bromopropane undergoes dehydrohalogenation reactions.
(ii) Chlorobenzene undergoes nitration reaction.
(iii) Methylbromide is treated with KCN.

21) Following compounds are given to you
2-bromopentane, 2-bromo-2-methylbutane, 1-bromopentane
(i)   Write the compound which is most reactive towards S_N2 reaction.
(ii) Write the compound which is optically active.
(iii) Write the compound which is most reactive towards β-elimination reaction.

22) How do you convert the following?
(i)   Chlorobenzene to biphenyl
(ii) Propene to 1-iodopropane
(iii) 2-bromobutane to but-2-ene.

23) Write the major products in the following:

(i)

O_2N —[benzene ring]— $CH_2\text{-}CH_3$ $\xrightarrow{\text{Br}_2,\ \text{UV light}}$

(ii)

$2CH_3\!\!-\!\!\underset{\underset{Cl}{|}}{CH}\!\!-\!\!CH_3 \xrightarrow[\text{Dry ether}]{Na}$

(iii)

$CH_3\!-\!CH_2\!-\!Br \xrightarrow{AgCN}$
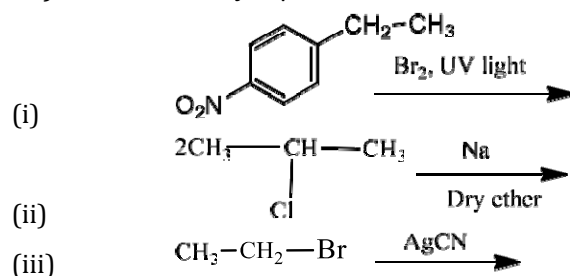
24) Give reasons:

(i) C–Cl bond length in chlorobenzene is shorter than C–Cl bond length in CH_3—Cl.

(ii) The dipole moment of chlorobenzene is lower than that of cyclohexylchloride.

(iii) S_N1 reactions are accompanied by racemisation in optically active alkylhalides.

(iv) C–X bond length in halobenzene is smaller than C–X bond length in CH_3–X.

25) Draw the structure of major monohalo product in each of the following reactions:

(i)

[cyclohexyl]— OH $\xrightarrow{SOCl_2}$

(ii)

[benzene ring]— $CH_2\!\cdot\!CH\!=\!CH_2 \xrightarrow[\text{HBr}]{\text{Peroxide}}$
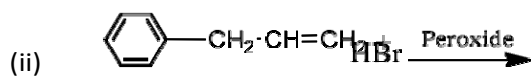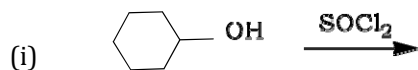
BIOLOGY

1. An_____is one in which micropyle and chalaza are in the straight line of unicle.

2. _____is the epigynous flower.

3. Anemophily is found in case of_____.

4. In case of _____, heteromorphism is found.

5. In floweing plants, unisexual male flowe is called_____.

6. _____is the fertile pat of the stamen.

7. Flower organs have evolved from the modified_____.

8. eiosis in anther occurs in _____.

9. Ploidy in a pollen grain of cyperus is_____.

10. A monothecous anther with two microsporangia is found in_____.

11. The two major wall layers of pollen grain are_____.

12. _____is the male gametophyte of angiosperms.

13. _____in the anther are mutinucleated and polyploid.

14. In amoeboid type of tapetum, the cells fuse of form_____.

15. Longest pollen tube is found in_____.

16. The inner layer of exine of pollen grain is_____.

17. Single microsporangium per anther is found in_____

18. Successive type of microsporogenesis is found in_____.

19. Embryo sac occurs in _____.

20. Ovule is unitegmic in _____.

ONE MARK QUESTIONS

1.In a young anther, a group of compactly arranged homogenous cells were observed in the centre of each microsporangium. What is the name given to these cells?

2. Give the scientific name of a plant which came to India as a contaminant with imported wheat and causes pollen allergy.

3. Pollen grains of water pollinated species have a special characteristics for protection from water. What is that?

4. Why are pollen grains produced in enormous quantity in Maize?

5. In same species of Asteraceae and grasses, seed are formed without fusion of gametes. Mention the scientific term for such form of reproduction.
Ans.

_____

6. Arrange the following in correct developmental sequence : Male gamete, Potential pollen mother cell, sporogenous tissue, Pollen grains, Microspore tetrad.
Ans. .

_____

7. If the diploid number of chromosomes in an angiospermic plant is 16. Mention number of chromosomes in the endosperm and antipodal cell.
Ans. _

_____

8. What kind of structures is formed at the end of microsporogenesis and megasporogenesis?
Ans.

_____

9. Why is emasculation done in the process of hybridization?

Ans:

10. Name one plant each where pollination occurs with the help of
a) Water.
b) Bats

_____

TWO MARKS QUESTIONS

1.Fruits generally develops from ovary, but in few species thalamus contributes to fruit formation.
(a) Name the two categories of fruits.
(b) Give one example of each.

2. Differentiate between geitonogamy and xenogamy.

3. Differentiate between chasmogamous and cleistogamous flowers

4. Given below is an incomplete flow chart showing formation of gamete in angiospermic plant. Observe the flow chart carefully and fill in the blank A, B, C and D.
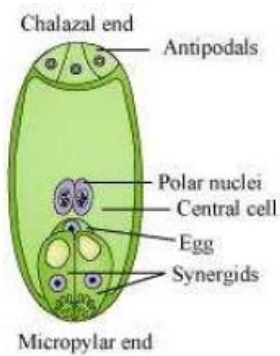
5. Draw a well labeled diagram of longitudinal section of pistil showing pollen germination?

3 MARKS QUESTIONS

Differentiate between microsporogenesis and megasporogenesis. What type of cell division occurs during these events. Name the structure formed at the end of these two events.
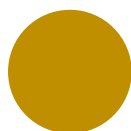
Give any three advantages of sexual incompatibility.

Explain the structure of a maize grain with the help of a diagram.

How dose pollination takes place in salivia. List any four adaptations required for such type of pollination.

5 MARKS

1.Describe the post-fertilization changes taking place in a flowering plant?

MATHEMATICS

CASE STUDY 1:

A general election of Lok Sabha is a gigantic exercise. About 911 million people were eligible to vote and voter turnout was about 67%, the highest ever. Let I be the set of all citizens of India who were eligible to exercise their voting right in general election held in 2019. A relation 'R' is defined on I as follows:

R = {$(V1, V2) : V1, V2 \in I$ and both use their voting right in general election – 2019}

1. Two neighbors X and Y∈ I. X exercised his voting right while Y did not cast her vote in general election – 2019. Which of the following is true?

a. (X, Y) ∈R

b. (Y, X) ∈R

c. (X, X) ∉R

 d. (X, Y) ∉R

2. Mr.'X' and his wife 'W'both exercised their voting right in general election -2019, which of the following is true?

a. Both (X, W) and (W, X) ∈ R

 b. (X, W) ∈ R but (W, X) ∉ R

c. both (X, W) and (W,X) ∉ R

 d. (W, X) ∈ R but (X, W) ∉ R

3. Three friends F1, F2 and F3 exercised their voting right in general election-2019, then which of the following is true?

a. (F1, F2) ∈R, (F2, F3) ∈ R and (F1, F3) ∈ R

 b. (F1, F2) ∈ R, (F2, F3) ∈ R and (F1, F3) ∉ R

 c. (F1, F2) ∈ R, (F2, F2) ∈R but (F3, F3) ∉ R

d. (F1, F2) ∉ R, (F2, F3) ∉ R and (F1,F3) ∉ R

4. The above defined relation R is _____

a. Symmetric and transitive but not reflexive

b. Universal relation

c. Equivalence relation

d. Reflexive but not symmetric and transitive

 5. Mr. Shyam exercised his voting right in General Election – 2019, then Mr. Shyam is related to which of the following?

 a. All those eligible voters who cast their votes

 b. Family members of Mr.Shyam

c. All citizens of India

 d. Eligible voters of India

CASE STUDY: 2

Sherlin and Danju are playing Ludo at home during Covid-19. While rolling the dice, Sherlin's sister Raji observed and noted the possible outcomes of the throw every time belongs to set {1, 2, 3, 4, 5, 6}. Let A be the set of players while B be the set of all possible outcomes. A = {S, D}, B = {1, 2, 3, 4, 5, 6}

1. Let $R : B \rightarrow B$ be defined by R = {(x, y): y is $divisible$ } is

a. Reflexive and transitive but not symmetric

b. Reflexive and symmetric and not transitive

c. Not reflexive but symmetric and transitive

d. Equivalence

2. Raji wants to know the number of functions from A to B. How many number of functions are possible?

a. 62

b. 26

c. 6!

d. 212

3. Let R be a relation on B defined by R = {(1,2), (2,2), (1,3), (3,4), (3,1), (4,3), (5,5)}. Then R is

a. Symmetric

b. Reflexive

c. Transitive

d. None of these three

4. Raji wants to know the number of relations possible from A to B. How many numbers of relations are possible?

a. 62

b. 26

c. 6!

d. 212

5. Let $R:B \rightarrow B$ be defined by R={(1,1),(1,2), (2,2), (3,3), (4,4), (5,5),(6,6)}, then R is

a. Symmetric

b. Reflexive and Transitive

c. Transitive and symmetric

d. Equivalence

CASE STUDY: 3

Students of Grade 9, planned to plant saplings along straight lines, parallel to each other to one side of the playground ensuring that they had enough play area. Let us assume that they planted one of the rows of the saplings along the line $y = x - 4$. Let L be the set of all lines which are parallel on the ground and R be a relation on L.

Answer the following using the above information.

1. Let relation R be defined by R = {$(L1, L2)$: $L1 \parallel L2$ where L1,L2 € L} then R is_____ relation

a. Equivalence

b. Only reflexive

c. Not reflexive

d. Symmetric but not transitive

2. Let R = {$(L1, L2)$: $L1 \perp L2$ where L1,L2 € L } which of the following is true?

a. R is Symmetric but neither reflexive nor transitive

b. R is Reflexive and transitive but not symmetric

c. R is Reflexive but neither symmetric nor transitive

d. R is an Equivalence relation

3. The function f: R→R defined by $(x) = x - 4$ is_____

a. Bijective

b. Surjective but not injective

c. Injective but not Surjective

d. Neither Surjective nor Injective

4. Let $f : R \rightarrow R$ be defined by $(x) = x - 4$. Then the range of (x) is _____

a. R

b. Z

c. W

d. Q

5. Let R = {(L 1, L 2) : L 1 is parallel to L 2 and L 1 : y = x − 4} then which of the following can be taken as L 2 ?

 a 2x-2y+5=0

b. 2x+y=5

c.2x + 2y + 7 =0

d. x+ y=7

MATRICES AND DETERMINANT

1 Mark Questions

1. A matrix A of order 3 x 3 has determinant 5. Find the value of $|3A|$.

2. Find the cofactor of a_{12} in the following : $\begin{vmatrix} 1 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$.

3. If A is a square matrix of order 3 such that $|adj\, A| = 64, find\, |A|$.

4. If A is a square matrix and satisfies the relation $A^2 + A - I = 0$, then find A^{-1}.

5. For what value of a, $\begin{bmatrix} 2a & -1 \\ -8 & 3 \end{bmatrix}$ is singular matrix?

6. A square matrix ' A' , of order 3 has $|A| = 5$, find $|A\, adj\, A|$.

7. For what value of k, the matrix $\begin{bmatrix} 2-k & 3 \\ -5 & 1 \end{bmatrix}$ is not invertible.

8. A matrix A is of order 2 x 2 has determinant 4. What is the value of $|2A|$?

9. If A and B are symmetric matrices of same order, write whether AB – BA is symmetric or skew symmetric.

4 Marks Questions

10. If $A = \begin{bmatrix} 2 & 3 \\ 1 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix}$, show $(AB)^{-1} = B^{-1} A^{-1}$.

11. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$, find the value of a and b : $A^2 + Aa + bI = 0$. Hence find A^{-1}.

12. Express the matrix $\begin{bmatrix} 2 & 3 & 4 \\ 5 & 7 & 9 \\ -2 & 1 & 1 \end{bmatrix}$ as the sum of symmetric and a skew symmetric matrix.

13. Find the values of x, y, z if $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfies the eqn $A'A = I$.

14. If $A = \begin{bmatrix} 3 & -4 \\ 1 & 1 \end{bmatrix}$. Prove $A^n = \begin{bmatrix} 1+2n & -4n \\ n & 1-2n \end{bmatrix}$ for all $n \in N$.

15. If $A = \begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix}$, show $A^2 - 5A - 14I = 0$ and hence find A^{-1}.

16. Find 2 x 2 matrix B : $B \begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix} = \begin{bmatrix} 6 & 0 \\ 0 & 6 \end{bmatrix}$.

17. .Using properties of determinants, prove : $\begin{vmatrix} 3a & -a+b & -a+c \\ a-b & 3b & c-b \\ a-c & b-c & 3c \end{vmatrix} = 3(a + b +c)\, (ab + bc + ca)$

18. .Using properties of determinants, prove : $\begin{vmatrix} y+z & z & y \\ z & z+x & x \\ y & x & x+y \end{vmatrix} = 4xyz$

19. Using properties of determinants, prove $\begin{vmatrix} a^2+1 & ab & ac \\ ba & b^2+1 & bc \\ ca & cb & c^2+1 \end{vmatrix} = a^2 + b^2 + c^2 + 1.$
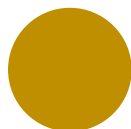
COMPUTER SCIENCE
My SQL Worksheet-1   (DDL – Database Related commands)

1.	If a database "Employee" exists, which MySql command helps you to start working in that database?
2.	Write MySql command will be used to open an already existing database "LIBRARY".
3.	Write MySql command to open an existing database.
4.	What does SQL stand for?
5.	Write two examples of DBMS software.
6.	Sharmila wants to make the database named 'COMPANY' active. Write MySQL commands for it.
7.	What is MySQL ?
8.	Mention any two example of common Database Management System.
9.	Suggest Archana suitable command for the following purpose: i. To display the list of the database already existing in MySQL. ii. To use the database named City. iii. To remove the pre-existing database named Clients.
	i. ii. iii.
10.	Write the command to create a new database "School"

My SQL Worksheet-2
(DDL – Table Related commands excluding Alter table)

1.	Write an SQL query to create the table 'Menu' with the following structure:

Field	Type
ItemCode	Varchar(5)
ItemName	Varchar(20)
Category	Varchar(20)
Price	Decimal(5,2)

2.	Write MySql command to create the Table STOCK. Table STOCK :

Name of Column	Type	Size
Id	Decimal	4
Name	Varchar	20
Company	Varchar	20
Price	Decimal	8

3.	Write one similarity and one difference between CHAR and VARCHAR data types.

4.	Saumya had previously created a table named 'Product' in a database using MySQL. Later on she forgot the table structure. Suggest her suitable MySQL command through which she can check the structure of the already created table.

5.	Roli wants to list the names of all the tables in her database named 'Gadgets'. Which command (s) she should use to get the desired result.

6.	Name the SQL commands used to : (i) Physically delete a table from the database. (ii) Display the structure of a table.
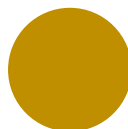
7.	An attribute A of datatype varchar(20) has the value "Amit" . The attribute B of datatype char(20) has value "Karanita" . How many characters are occupied in attribute A ? How many characters are occupied in attribute B?
8.	Mrs. Sharma is the classteacher of Class 'XII A' She wants to create a table 'Student' to store details of her class. Which of the following can be the attributes of Student table? a) RollNo b) "Amit" c) Name d) 25

9. Write SQL query to create a table 'Player' with the following structure:

Field	Type
playerid	Integer
name	Varchar(50)
height	Integer
weight	Integer
datebirth	Date
teamname	Varchar(50)

10. Anita has created the following table with the name 'Order'.

Column Name
OrderId
OrderDate
OrderAmount
StoreId

One of the rows inserted is as follows :

OrderId	OrderDate	OrderAmount	StoreId
O101	2015-02-12	34000	S104

What is the data type of columns OrderId and OrderDate in the table Order ?

11. Write SQL query to create a table 'Event' with the following structure :

Field	Type
EventId	Varchar(5)
EventName	Varchar(30)
Location	Varchar(50)
ClientID	Integer
EventDate	Date

My SQL Worksheet-3
(DDL – Alter Table commands)

1.	Sahil created a table in Mysql. Later on he found that there should have been another column in the table. Which command should he use to add another column to the table?
2.	Kuhu has already created a table 'Hospital' as shown below:

Patient_No	Patient_Name	Disease	Age	Charges
P001	Alya	Viral Fever	14	500
P002	Kavita	Lung Infection	16	1500
P003	Manya	Cough and Cold	20	500
P004	Amar	Bone Fracture	22	2500
P005	Deep	Viral Fever	15	500

Now she wants to add a new column 'Address' to the above given table. Suggest suitable MySQL command for the same.

3.	Write SQL command to remove column named 'Hobbies' from a table named 'Student'.
4.	While creating the table Student last week, Ms. Sharma forgot to include the column Game_Played. Now write a command to insert the Game_Played column with VARCHAR data type and 30 size into the Student table?
5.	Kunal created the following table with the name 'Friends' :

Table : Friends

FriendCode	Name	Hobbies
F101	Bijoy	Swimming
F102	Abhinav	Reading books
F103	Jyotsna	Dancing

Now, Kunal wants to delete the 'Hobbies' column. Write the MySQL statement

6.	Rashi wants to add another column 'Hobbies' with datatype and size as VARCHAR(50) in the already existing table 'Student'. She has written the following statement. However it has errors. Rewrite the correct statement. MODIFY TABLE Student Hobbies VARCHAR;

My SQL Worksheet-4   (DML – INSERT INTO commands)

1.	Consider the table RESULT given below. **Table : Result** | No	Name	Stipend	Subject	Average	Division
----	------	---------	---------	---------	----------
1	Sharon	400	English	38	THIRD	 Write command to insert a new row 6, "Mohan", 500, "English", 73, "Second"
2.	Consider the Table SHOPPE given below. Table **SHOPPE** : | Code	Item	Company	Qty	City	Price
------	------	---------	-----	------	-------
102	Biscuit	Hide & Seek	100	Delhi	10.00	 To insert a new row in the table Shoppe '110', 'Pizza' , 'Papa Jones', 120, "Kolkata", 50.0
3.	How is NULL value different from 0 (Zero) value?
4.	Consider the following table named "GYM" **Table GYM:** 	ICODE	INAME	PRICE	BRANDNAME
-------	-------	-------	-----------
G101	Power Fit Exerciser	20000	Power Gymea	 Add a new row for a new item in GYM with the details: "G107", "Vibro exerciser" ,21000, "GTCFitness"
5.	Rewrite the following SQL statement after correcting error(s). Underline the corrections made. INSERT IN STUDENT(RNO,MARKS) VALUE (5,78.5);
6.	Rewrite the following SQL statement after correcting error(s). Underline the corrections made. INSERT IN EMP(EMPNO, SALES) VALUE (100, 20078.50);
7.	Charvi is inserting "Sharma" in the "LastName" column of the "Emp" table but an error is being displayed. Write the correct SQL statement. INSERT INTO Emp('Sharma')VALUES(LastName) ;
8.	In today's digitized world with a need to store data electronically, it is very important to store the data in the databases. SQL is used to interact with the Database Management System. Classify the following commands according to their type :(DDL/DML) i. INSERT INTO ii. ALTER TABLE
9.	Write the full forms of the following: i. DDL ii. DML

My SQL Worksheet-5

(DML – UPDATE and DELETE commands)

1.	What is the purpose of DROP TABLE command in SQL? How is it different from DELETE command?
2.	In a database there is a table "Product" as shown below :

Table : PRODUCT

P_ID	ProductName	Manufacture	Price
P001	Moisturiser	XYZ	40
P002	Sanitizer	LAC	35
P003	Bath Soap	COP	25
P004	Shampoo	TAP	95
P005	Lens Solution	COP	350

Write the command To increase the Price of all the Products by 20.

|	
3.	Write the UPDATE command to change "Sharma" to "Singh" in the "LastName" column in the Employee table.
4.	What is the use of UPDATE statement in SQL ? How is it different from ALTER statement?
5.	Consider the following table named "GYM"

Table GYM:

ICODE	INAME	PRICE	BRANDNAME
G101	Power Fit Exerciser	20000	Power Gymea
G102	Aquafit Hand Grip	1800	Reliable
G103	Cycle Bike	14000	Ecobike
G104	Protoner Extreme Gym	30000	Coscore
G105	Message Belt	5000	MessagExpert
G106	Cross Trainer	13000	GTCFitness

Write command To change the Brandname to "Fit Trend India" of the item, whose ICODE as "G101 ".

6.	Write the UPDATE statement in MySQL to increase commission by 100.00 in the ''Commission'' column in the 'Emp' table.
7.	Write two examples of DML commands of SQL.
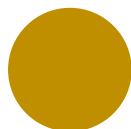
8.	Consider the following table named "GARMENT".

Table : GARMENT

GCODE	GNAME	SIZE	COLOUR	PRICE
111	TShirt	XL	Red	1400.00
112	Jeans	L	Blue	1600.00
113	Skirt	M	Black	1100.00
114	Ladies Jacket	XL	Blue	4000.00
115	Trousers	L	Brown	1500.00
116	Ladies Top	L	Pink	1200.00

1) Write command To change the colour of garment with code as 116 to "Orange".
2) Write command to increase the price of all XL garments by 10%
3) Write command to delete the record with GCode "116"

9.	In Marks column of 'Student' table, for Rollnumber 2, the Class Teacher entered the marks as 45. However there was a totaling error and the student has got her marks increased by 5. Which MySQL command should she use to change the marks in 'Student' table.

| 10. | Chhavi has created a table named Orders, she has been asked to increase the value of a column named salesamount by 20. She has written the following query for the same.
| | Alter table Orders Add salesamount =salesamount+20;
| | Is it the correct query?Justify. |

| 11. | Consider the following table:
| | Table: PharmaDB |

RxID	Drug ID	DrugName	Price	Pharmacy Name	PharmacyLocation
R1000	5476	Amlodipine	100.00	Rx Pharmacy	Pitampura, Delhi
R1001	2345	Paracetamol	15.00	Raj Medicos	Bahadurgarh, Haryana
R1002	1236	Nebistar	60.00	MyChemist	Rajouri Garden, Delhi
R1003	6512	VitaPlus	150.00	MyChemist	Gurgaon,Haryana
R1004	5631	Levocitrezine	110.00	RxPharmacy	South Extension,Delhi

Write commands in SQL to increase the price of "Amlodipine" by 50.
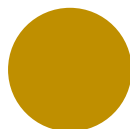
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