



N. D. JAIN SCHOOL, BAH, AGRA

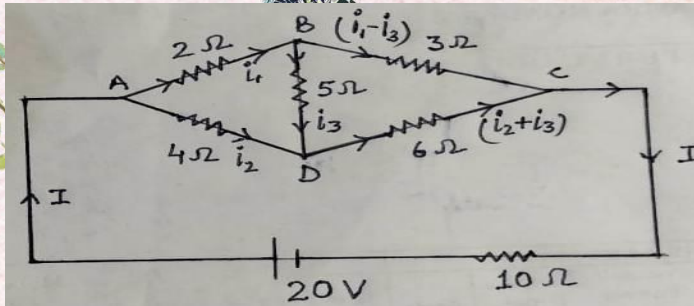
Session:2025-26

Home Assignment

Class- XII SCIENCE

Sub: PHYSICS

Ques 1. Find current in each branch of given network.



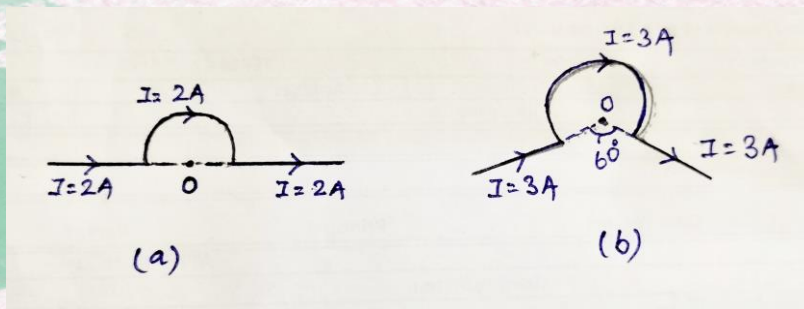
Ques 2. A square of side 10 cm is placed on a horizontal plane. An electric field of E is applied to it. The unit normal vector to the surface of the square is $(0.8 \hat{i} + 0.6 \hat{j})$. Find the net flux passing through the square.

Ques 3. Two balls of mass 100g and each carrying a charge of $2 \times 10^{-7} \text{C}$ are suspended from a common point through a string of length 50 cm. Both are initially separated by 5 cm distance.

(i) Find the electric force on one of the balls. (ii) Find tension in the string.

Ques 4. A dielectric medium of strength 'k' is filled between two concentric spherical conductors of radii 'a' and 'b' (with $a \ll b$) upto distance 'c' from their centre. Find the new capacitance of the conductors.

Ques 5.



Find the strength of the magnetic field at point 'O' in both cases.

Ques 6. A conductor of length 20 cm and area of cross-section 100cm^2 is placed in a uniform magnetic field of strength 0.02 Tesla, with its plane making an angle of 30° with the vertical. Determine the torque acting on the conductor if it carries a current of 5 A.

Also find the torque on a coil of 100 turns which is identical to conductor and

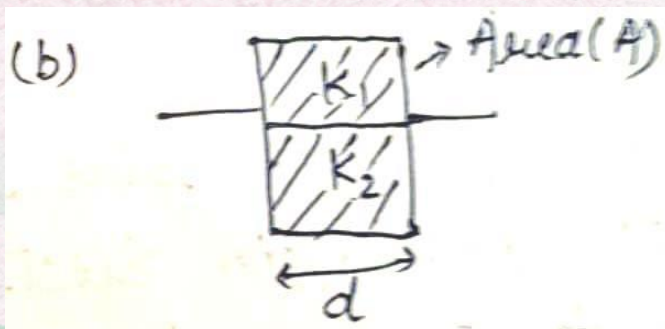
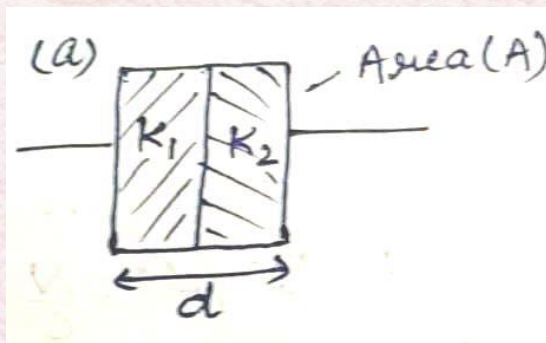
placed in same situation.

Ques 7. Two charges $2\mu\text{C}$ and $-3\mu\text{C}$ are placed at positions $(0,0,-15\text{cm})$ and $(0,0,+15\text{cm})$ respectively.

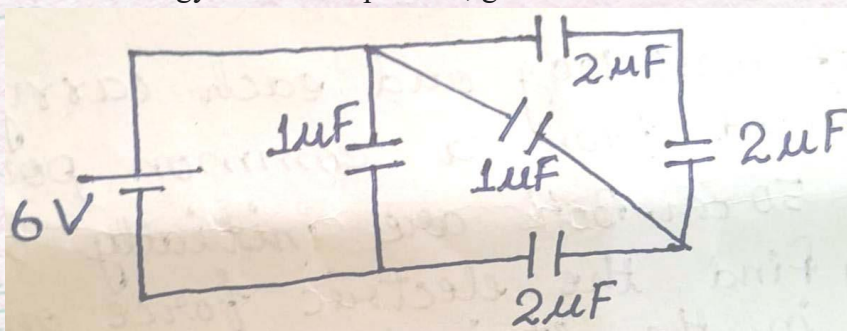
Find the point at which net potential is zero.

Find point at which net \vec{E} field is zero. The point must lie on the line joining both charges.

Ques 8. Find net dielectric strength in both the cases.



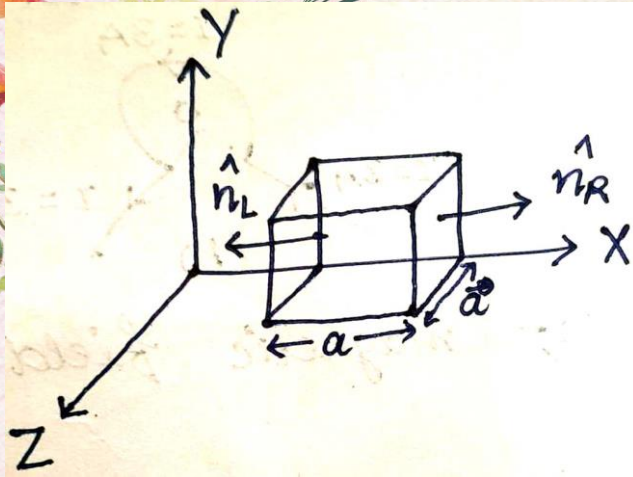
Ques 9. Find total energy stored in capacitors, given in the circuit.



Ques 10. The electric field components in the following figure are $E_x = \alpha x$, $E_y = 0$, $E_z = 0$; in which $\alpha = 400\text{N/C}$. Calculate


the electric flux through the cube, and

(ii) the charge within the cube. Assume that $a=0.1\text{m}$.






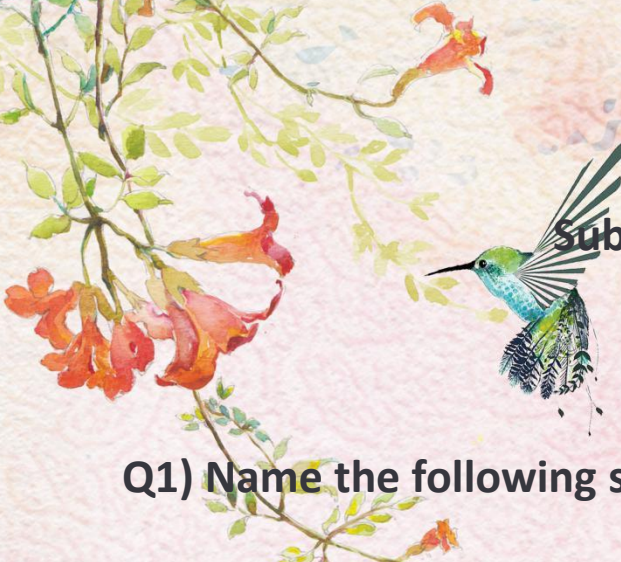
Sub: Chemistry

1. Henry's law constant for CO_2 in water is $1.67 \times 10^8 \text{ Pa}$ at 298 K . Calculate the quantity of CO_2 in 500 mL of soda water when packed under 2.5 atm CO_2 pressure at 298 K .
 2. Boiling point of water at 750 mm Hg is 99.63°C . How much sucrose is to be added to 500 g of water such that it boils at 100°C ?
 3. Write the Colligative properties in detail. (a) Depression in freezing point. (b) Elevation in boiling point.
 4. Calculate the mass of a non-volatile solute (Molecular mass = 40) which should be dissolved in 114 g octane to reduce its vapour pressure to 80% .
 5. Describe Ideal and Non-Ideal solutions. Explanation for positive and Negative deviations.
 6. Calculate the standard reduction electrode potential of the $\text{Ni}^{2+} | \text{Ni}$ electrode when the cell potential for the cell $\text{Ni} | \text{Ni}^{2+}(1\text{M}) || \text{Cu}^{2+}(1\text{M}) | \text{Cu}$ is 0.59 V . Given that ($E^\circ \text{Cu}^{2+} | \text{Cu} = 0.34 \text{ V}$).
 7. Write the NERNST equation with application.
 8. Calculate the reduction potential of the following electrode at 298 K .
 $\text{Pt}, \text{Cl}_2(2.5 \text{ atm}) | \text{HCl}(0.01 \text{ M}) : E^\circ \text{Cl}_2 | 2\text{Cl}^- = 1.36 \text{ V}$
 9. Write the Nernst equation and Calculate the e.m.f. of the following cell at 298 K .
 $\text{Cu}(s) | \text{Cu}^{2+}(0.130 \text{ M}) || \text{Ag}^+(1.0 \times 10^{-4} \text{ M}) | \text{Ag}(s)$
Given: $E^\circ \text{Cu}^{2+} | \text{Cu} = +0.34 \text{ V}$
 $E^\circ \text{Ag}^+ | \text{Ag} = +0.80 \text{ V}$
 10. What are fuel cells, and explain in detail Hydrogen-oxygen fuel cell.
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Sub: Mathematics

1. Check whether the Relation S in the set of all Real numbers (\mathbb{R}) defined by $S = \{(a,b) : a \leq b^3\}$ is Reflexive, Symmetric or transitive.
 2. If $x \sin(a+y) - \sin y = 0$, prove that .
 3. Find , if $y = (\cos x)^x + \cos^{-1} \sqrt{x}$.
 4. Find a matrix A such that $A =$.
 5. Given a Square matrix A of order 3 such that $A^2 =$, Show that $A^3 = A^{-1}$.
 6. Find the value of $\cos^{-1}() - \tan^{-1}() + \operatorname{cosec}^{-1}(-2)$.
 7. If $y^x = x^y$, then find .
 8. $\sin^{-1}(\sin) + \cos^{-1}(\cos) + \tan^{-1}$.
 9. If $y = \cos^{-1}$, $0 < x < 1$, then find .
 10. Find , if $y = 2^{\cos x} - 2^{\sin x}$.
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Sub: Biology

Q1) Name the following structures -


- a) Single cotyledon of the monocotyledonous embryo of grass family.**
- b) The portion of embryonal axis above the level of cotyledons in dicot embryo.**
- c) Occurrence of more than one embryo in a seed.**
- d) Seedless fruits produced without fertilization.**

Q2) Is it possible to store pollen grains? What do we call the process of pollination using pollen grains of desired plant?

Q3) Give characteristics of insect pollinated flowers.

Q4) What is parturition? Which hormones are involved in the induction of parturition?

Q5) Mention one positive and one negative application of amniocentesis.






Q6) Expand and explain GIFT, ICSI, ZIFT, ET and IUT.

Q7) A cross was carried out between two pea plants showing the contrasting traits of height of the plants. The results of the cross showed 50% parental characters.

(i) Work out the cross with the help of a Punnett square.

(ii) Name the type of the cross carried out.

Q8) Differentiate between incomplete dominance and codominance. Substantiate your answer with one example of each.



Q9) Name the kind of diseases/disorders and their symptoms that are likely to occur in humans if

(i) Mutation in the gene that codes for an enzyme phenylalanine hydroxylase occurs.

(ii) the karyotype is XXY.

Q10) Draw Diagrams of the following

a) T.S. of young anther

b) L.S. of monocot seed (maize)



physical Education

Answer the following questions.

Q 1. What is the role of the organizing in the functions of sports events management?

Q 2. How are various committees formed for tournaments? Write briefly.

Q.3. Write formula for giving bye.

Q.4 What is bye?

Q 5. Draw a Knockout fixture for 27 teams.



Q1. How does the "Lost Spring" highlight the apathy of society and those in power to end the vicious cycle of poverty? Support your answer with textual evidence.

Q2. Imagine that the bully who threw Douglas into the pool, reads this chapter and realizes his mistake. As the bully, write a diary entry penning down your response to Douglas perseverance and your own feelings of guilt and regret.

Q3. You visited a wildlife sanctuary and the plight of the animals there. Write an article for expressing your concern and the need to allocate sanctuary and provide the animals with a secure habitat.

Q4. Write a letter to the Editor of the local daily newspaper. You are Kanika/Karan, Your school's Fitness Club hosted a workshop called 'Art of Living for Students'. Write a letter to the editor of the local daily newspaper, giving your thoughts on the matter.

English

Q 5. You are Secretary of Gymkhana Club, Meerut.

Write a notice in not more than 50 words informing the members to attend an extraordinary meeting of the governing body include details like date, time, venue etc. Sign as Prabhu/Pratibha.

