SRINI SCIENCE MIND

10th CLASS
ENGLISH MEDIUM
New Pattern

PHYSICAL SCIENCE

ACADEMIC STANDARD WISE IMPORANT QUESTIONS

Question wise weightage table

S.No	Type of questions	Number of questions	Marks allotted	Total marks	percentage
1.	Objective questions	12	1/2	6	12
2.	Very short answer questions	8	1	8	16
3	Short answer question	8	2	16	24
4	Essay questions	5	4	20	40
	Total	33		50	100

→Section IV containing 5 questions

→Each question carries 4Marks

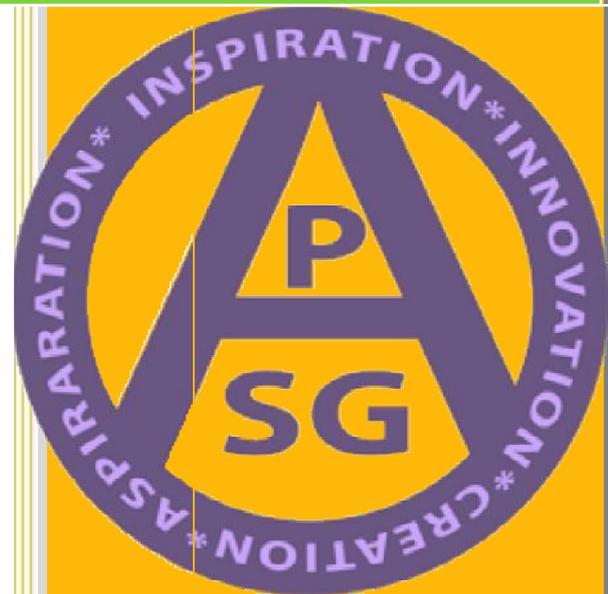→Internal choice type

→Four Academic Standards Questions Covered

→AS_1, AS_3, AS_4 and AS_5

→Two AS_1 Questions, One AS_3 Question, One AS_4 Question and One AS_5 Question

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AS₁ (Conceptual understanding)

1)Explain why dogs pant during hot summer days using the concept of evaporation?

2)Calculate required heat energy to change 12g of ice at -10^0C into water vapour at 100^0C

3)Write the differences between evaporation and boiling?

4)Write the differences heat evaporation and specific heat?

5)Why does tooth decay start when the pH of mouth is lower than 5.5?

6) Explain the formation of mirages?(OR) What is the reason behind formation of mirage? Explain

7) Explain the phenomenon of total internal reflection with one or two activities

8) How do you correct the eye defect Myopia?

9) Explain the correction of the eye defect Hypermetropia.

10) Explain the formation of rainbow.

11)Explain briefly the reason for the blue of the sky.

12) Explain two activities for the formation of artificial rainbow.

13) Rainbow is an example for continuous spectrum – explain.

14) Explain the significance of three Quantum numbers in predicting the positions of an electron in an atom.

15) Explain Aufbau principle with an example

16)Explain Hund's rule with an example

17)Explain Pauli's exclusion principle with an example

18)Define the modern periodic Law. Discuss the construction of the long form of the periodic table.

19) Explain how the elements are classified into s, p, d and f- block elements in the periodic table and give the advantage of this kind of classification

20) What is a periodic property? How do the following properties change in a group and period? Explain.

(a) Atomic radius (b) Ionization energy (c) Electron affinity (d) Electronegativity.

21)What is ionization energy? What are the factors that influence the value of ionization energy?

22)What is ionic bond? How does ionic bond is form? Explain with one example

23) Explain the formation of the following molecules using valence bond theory

a) N_2 molecule   b) O_2 molecule

24) What is hybridisation? Explain the formation of the following molecules using hybridisation

a) $BeCl_2$ b) BF_3

25) Explain Kirchhoff's laws with examples.

26) Deduce the expression for the equivalent resistance of three resistors connected in series.

27) Deduce the expression for the equivalent resistance of three resistors connected in parallel.

28) Explain the working of electric motor with a neat diagram

29) Explain the working of AC electric generator with a neat diagram.

30) Explain the working of DC generator with a neat diagram.

31) Explain with the help of two activities that current carrying wire produces magnetic field.

32) Explain Faraday's law of induction with the help of activity

33) Write short notes on froth floatation process?

34) Write a note on dressing of ore in metallurgy?

35) What is thermite process? Mention its applications in daily life?

36) Where do we use handpicking and washing methods in our daily life? Give examples. How do you correlate these examples with enrichment of ore?

37) Define homologous series of carbon compounds; Mention any two characteristics of homologous series.

38) Explain the cleansing action of soap.

39) Distinguish between esterification and saponification reactions of organic compounds.

40) Write the Substitution reactions of Alkanes.

AS₃ (Experimentation and field Investigation)

1) How do you of find specific heat of solid experimentally?

2) Suggest an experiment to prove that the rate of evaporation of a liquid depends on its surface area and vapour already present in surrounding air.

3) Compounds such as alcohols and glucose contain hydrogen but are not categorized as acids.

Describe an activity to prove it.

4) What is meant by "water of crystallization" of a substance? Describe an activity to show the water of crystallisation.

5) Write an activity to know the reaction of Carbonate or Hydrogen carbonate with acids (OR) Show that the reaction of Carbonates and Hydrogen carbonates with acids produces carbondioxide gas (OR)How do you prepare carbondioxide gas in your lab and how to test this gas?

6) How do you verify experimentally that sin i /sin r is a constant?

7)How do you verify experimentally that the angle of refraction is more than angle of incidence when light rays travel from denser to rarer medium

8) How do you verify experimentally that the angle of refraction is less than angle of incidence when light rays travel from rarer to denser medium.(OR) How to obtain a relation between angle of incidence and angle og refraction

9) How to find the refractive index of glass slab experimentally?

10)How do you verify experimentally that the focal length of a convex lens is increased when it is kept in water?

11) How do you find the focal length of a lens experimentally?(OR) You have a lens. Suggest an experiment to find out the focal length of the lens.

12) How do you find experimentally the refractive index of material of a prism.

13) Suggest an experiment to produce a rainbow in your classroom and explain the procedure.

14) How can you verify that the resistance of a conductor is temperature dependent?

15) How do you verify that resistance of a conductor is proportional to the length of the conductor for constant cross section area and temperature?

16) State Ohm's law. Suggest an experiment to verify it and explain the procedure.

17) How can you verify that a current carrying wire produces a magnetic field with the help of an experiment?

18) Suggest an experiment to prove that the presence of air and water are essential for corrosion. Explain the procedure.

19) Suggest a test to find the hardness of water and explain the procedure.

AS₄ (Information skills and Projects)

1) Observe the table and answer the following questions

Substance	Specific heat	
	In cal/g-°C	In J/kg-K
Lead	0.031	130
Mercury	0.033	139
Brass	0.092	380
Zinc	0.093	391
Copper	0.095	399
Iron	0.115	483
Glass(flint)	0.12	504
Aluminum	0.21	882
Kerosene oil	0.50	2100
Ice	0.50	2100
Water	1	4180
Sea water	0.95	3900

a)What is the SI unit of Specific heat ?

b)Which metal is best for cooking utensils? Why?

c)Which metal is slowly heated up among all given substance?

d)How much heat energy is required to rise 1^0 C of water of 1 gram?

e)Which metal is used to soldering the wires? Why?

f) Why different substances have different specific heats?

g) Write the formula of specific heat of the substance?

h) Convert 1 cal/g- ^{0}C into J/Kg-J

i)Which liquid used as coolant? Why?

2)Heat energy is continuously supplied to 1 kg of ice at -5^0C till it boils. By noting Temperature ,Time and Temperature-Time graph is drawn as follows. Answer the following questions
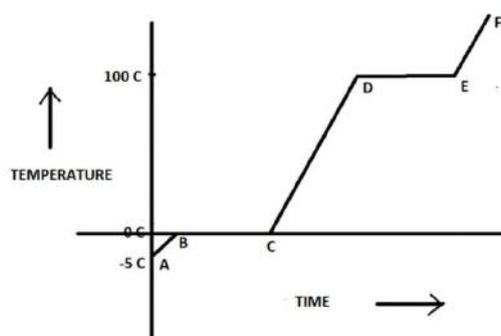
a)What is melting point of ice and boiling point of water?

b)What is the state and temperature at position C?

c)What is the state and temperature at position E?

d)What are the states of substance at AB and CD?

e)What are the states of substance at BC and DE?

f)Why there is no change in temperature at BC and DE even we gave heat energy continuously to the substance?

g)How much heat energy is required to convert 1 g of ice at 0^0C to water at 0^0C ?

h) How much heat energy is required to convert 1 g of water at 100^0C to vapour at 100^0C ?

3) Observe the table and answer the following questions

Liquid/Solution	pH
P	7
Q	6
R	11
S	2
T	8

a) Which solution(s) turn into pink by adding phenolphthalein ?

b) Which solution(s) turn into red by adding methyl orange?

c) Which is strong acid?

d) Which one indicates pure water?

e) If $P^H=7$,then find the $[H]^+$

f)Which solutions are acidic solutions?

g)Which colour given by solution Q with universal indicator?

h)Which colour gives by blue litmus paper when it is dipped in solution S?

4)Observe the table and answer the following questions
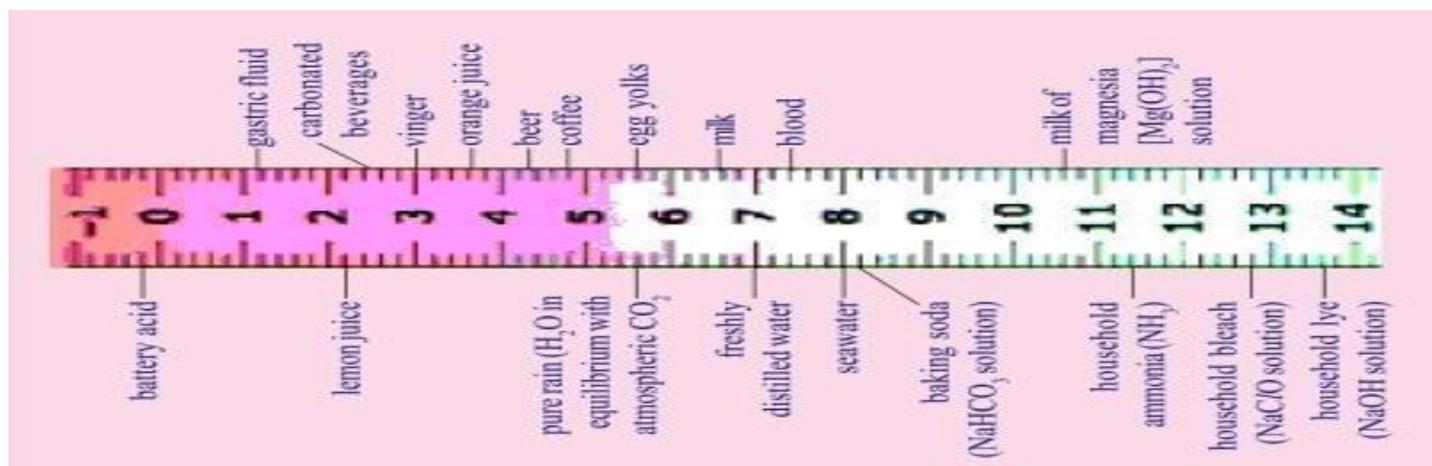
a) What is the nature of blood?

b) Which of the substances in the scale are used as antacids?

c) Which substance is neutral from above scale?

d) Which substance acts as strong base?

e) Which substance acts as strong acids?

f) What is the P^H range of bases?

g) Which is the neutral solution?

h) What is the chemical name of milk of magnesia?

i) What is nature of gastric juice based on strength?

j) Arrange the following in ascending order of their H^+ ion concentration?

   i) Vinegar ii)Distilled water iii)Baking Soda iv)Gastric fluid   v)House hold ammonia

k) Classify above substances as strong acid, strong base,weak acid and weak base

5)Complete the following table

S.No.	Sample solution	Red litmus paper	Blue litmus paper	Phenolphthalein solution	Methyl orange solution
1	HCl				
2	H_2SO_4				
3	HNO_3				
4	CH_3COOH				
5	$NaOH$				
6	KOH				
7	$Mg(OH)_2$				
8	NH_4OH				
9	$Ca(OH)_2$				

6) Complete the following table

S.No.	Solution	Colour pH paper	Approximate pH value	Nature of substances
1	HCl			
2	CH_3COOH			
3	NH_4Cl			
4	CH_3COONa			
5	$NaHCO3$			
6	Na_2CO_3			
7	$NaOH$			
8	Distilled water			
9	Lemon juice			
10	Carrot juice			
11	Coffee			
12	Tomato juice			
13	Tap water			
14	Banana juice			
15	Colourless aerated drink			
16	Saliva (before meal)			
17	Saliva (after meal)			

7) Observe the following table and answer the questions

Material medium	Refractive index	Material medium	Refractive index
Air	1.0003	Canada balsam	1.53
Ice	1.31	Rock salt	1.54
Water	1.33	Carbon Diasulphide	1.63
Kerosene	1.44	Dense flint glass	1.65
Fused quartz	1.46	Ruby	1.71
Turpentine oil	1.47	Sapphire	1.77
Crown glass	1.52	Diamond	2.42
Benzene	1.50		

a)Write the SI unit of Refractive index

b)What happens to the speed of light when light is passing from Water to Rock salt

c)Write the relation between speed of light(v) and refractive index of the material medium(n)

d)What is the speed of light in Benzene?

e)What is reason, RI of kerosene is more than the RI of water?

f)Among Ice, Fused quartz, Ruby and Diamond, Which is rarer medium? Why?

g)In the table, In which material medium speed of light is less? Why?

h)Define refractive index

i)Arrange the following materials medium based on the speed of the light

    Diamond, Tarpentine oil, Flint glass, Air and Ice

j)Whether the refracted ray bends towards normal or away from the normal when light ray

    travelled from Water to Kerosene

8)Fill the table following, which is related to convex lens

| Position of the Object	Position of the Image	Real/Virtual image	Inverted/Erected image	Enlarged/Diminished image
Beyond 2F2			Inverted	Diminished
	At 2F1	Real		Enlarged
Between 2F2 and F2	Beyond 2F1	Real		
	Same side of the Object		Erected	Enlarged

9) Student 'Bharath' conducted an experiment and find the focal length of symmetric convex lens.

Object distance(u)	Image distance(v)
60 cm	20 cm
30 cm	30 cm
25 cm	37.5 cm
20 cm	60 cm

a) What is the focal length of the convex lens?

b) What is the radius of curvature of the lens?

c) To get virtual image, at what distance should keep the object from the lens?

d) When object distance is 10 cm, where will image formed?

e) Find the magnification of the lens when object is kept at 20cm?

f) Which formula do you use to obtain focal length of the convex lens?

g) What are the characteristics of the image when object is placed at 30cm

10) Observe the figure and answer the questions
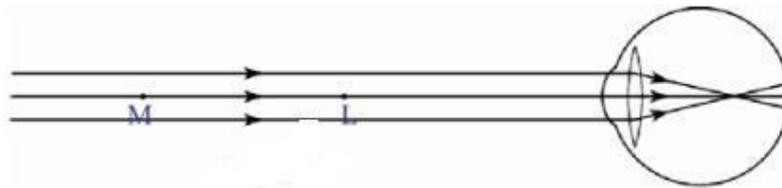
a)What type of eye defect indicates this figure?

b)In the figure, M stands for?

c) Define far point?

d) Which lens is used to correct this eye defect?

e)Draw the symbol of used lens?

f)What is the another name of this eye defect?

g)If the person suffering from this eye defect , what is the focal length of the eye lens?

h) Are the focal lens of the used lens is positive or negative?

11)Observe the following figure and answer the questions
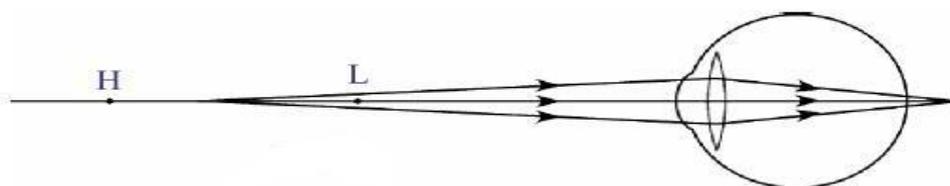
a) What type of eye defect indicates this figure?

b) In the figure, H stands for?

c) Define near point?

d) Which lens is used to correct this eye defect?

e) Draw the symbol of used lens?

f) What is the another name of this eye defect?

g) If the person suffering from this eye defect ,what is the focal length of the eye lens?

h) Are the focal lens of the used lens is positive or negative ?

12)Observe the following table and answer the following

Name of the Student	Power of lens used for a single eye
Bhavitha	+1 D
Bhavana	-2D
Bharathi	-1 D and +1 D

a) Who is suffering from hypermetropia

b)What type of vision defect has Bharathi

c) Which type of lens is used by Bhavana

d) What is the focal length of lens used by Bhavitha

13) Complete the following table

Period number	Filling up orbital's (sub shells)	Maximum number of electrons, filled in all the sub shells	Total no. of elements in the period
1			
2			
3			
4	4s, 3d, 4p	18	18
5			
6			
7	7s, 5f, 6d, 7p	32	incomplete

14) Complete the following table

Element	Atomic number (Z)	Electronic configuration of elements
C	6	
N	7	
O	8	
F	9	
Ne	10	
Na	11	
Mg	12	
Al	13	
Si	14	
P	15	
S	16	
Cl	17	
Ar	18	
K	19	
Ca	20	

15) Electronic configuration of element is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$ (OR) An element has atomic number is 15
Answer the following questions

a)What is the name of element?

b) How many electrons are present in L-shell ?

c) What is the (n+l) value of 3p orbital ?

d) In which orbital the next electron enters ?

e) Which period and which group the element belongs?

f)What are the number of valence electrons in the element?

g)Which block it belongs?

h)Is it metal or non metal?

i)What is the valancy of the element?

j)What is the name of the group which the element exists?

k) It is electropositive or electronegative ?

16) Complete the following table

Period number	Total no. of elements	Elements		Total no. of elements in			
		From	To	s-block	p-block	d-block	f-block
1							
2							
3							
4							
5							
6							
7							

17) Complete the following table

Group No.	Name of the element family	Elements		Valence shell configuration	Valence electrons	Valency
		From	To			
1 (IA)	Alkali metal family	Li	Fr	ns^1	1	1
2 (IIA)	Alkali earth metal family					
13 (IIIA)	Boron family					
14 (IVA)	Carbon family					
15 (VA)	Nitrogen family					
16 (VIA)	Oxygen family or (Chalcogen family)					
17 (VIIA)	Halogen family					
18 (VIIIA)	Noble gas family					

18) Complete the following table

Element	Valence electrons	Group number	Period number
Sulphur			
Oxygen			
Magnesium			
Hydrogen			
Fluorine			
Aluminum			

19) Observe the table and answer the questions

Element	Electronic configuration
A	$1s^2 2s^2$
B	$1s^2 2s^2 2p^6 3s^2$
C	$1s^2 2s^2 2p^6 3s^2 3p^3$
D	$1s^2 2s^2 2p^6$

a)Which are the elements coming within the same period?

b) Which are the elements coming within the same group?

c) Which are the noble gas elemnt?

d) To which group and period does the element 'C' belong?

e) Name the element 'D'

20) Observe the figure and answer the questions
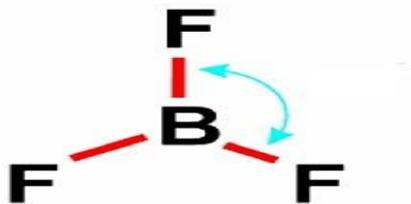
a) What is the hybridization present in BF_3 ?

b) What is the shape of BF_3?

c) What is the bond angle present in BF_3 ?

d) Why do BF_3 called as electron deficient compound?

e) What is the overlap present between Boron and Fluorine?

f) Which element act as central atom in this molecule?

g) What is valancy of Boron and Fluorine in BF_3 ?

h) What is the name of the molecule?

21) Observe the figure and answer the questions
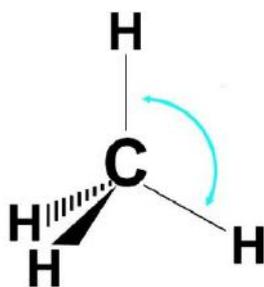
a) What is the shape of the molecule?

b) What type of hydridisation present in CH_4 ?

c) What is the name of the molecule?

d) What is the valancy of Carbon and Hyrogen in CH_4 ?

e) What is the bond angle in CH_4 ?

f) What is the overlap present between Carbon and Hydrogen?

22) Observe the figure and answer the questions
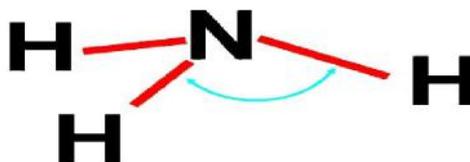
a)How many lone pairs present on Nitrogen atom in Ammonia ?

b)What is the shape of the molecule?

c)What is the bond angle present in the molecule?

d)What is the valancy of Nitrogen and Hydrogen in Ammonia?

e)What is the hybridisation present in Ammonia?

f)How many hybrid and atomic orbitals participated in the bonding ?

23) Observe the figure and answer the questions

a)What are the number of lone pairs and bond pairs present in the molecule?

b) What is the hybridisation present in the molecule?

c) What is the shape of the molecule?

d) What is the bond angle present in the molecule?

e) What is the valancy of Hydrogen and Oxygen in water molecule?

f)What is the overlap present in O-H bond?

g) What is the chemical name of Water?

24) Observe the figure and answer the questions

a)How many valance electrons are present in **Y**

b)How many valance electrons are present in **X**

c)How many covalent bonds are formed by **X** ?

d) How many covalent bonds are formed by **Y** ?

e)What is the valancy of **X** and **Y**

f)Suggest the names for elements **X** and **Y**

g)Which method used in the molecular representation

25) Amrutha conducted an experiment and her record the values of V and I are given below

Potential difference(v) volt	Current(I) amp
3	1
4.5	1.5
6	2
7.5	2.5
9	3

a) V/I= ?

b)What is resistance of the resistor used?

c)Does the used resistor is Ohmic or non Ohmic conductor?

d)If the potential difference is 15 volt, then what will be the current in the resistor?

e)What is shape of V-I graph of Ohmic conductor

f)Write the relation between V and I

26) Observe the table and answer the questions

| Material	$\rho_{(\Omega-m)}$ at 20 °C
Silver	1.59×10^{-8}
Copper	1.68×10^{-8}
Gold	2.44×10^{-8}
Aluminium	2.82×10^{-8}
Calcium	3.36×10^{-8}
Tungsten	5.60×10^{-8}
Zinc	5.90×10^{-8}
Nickel	6.99×10^{-8}
Iron	1.00×10^{-7}
Lead	2.20×10^{-7}
Nichrome	1.10×10^{-6}
Carbon (Graphite)	2.50×10^{-6}
Germanium	4.60×10^{-1}
Drinking water	2.00×10^{-1}
Silicon	6.40×10^{2}
Wet wood	1.00×10^{3}
Glass	10.0×10^{10}
Rubber	1.00×10^{13}
Air	1.30×10^{16}

a)On what factors does the resistivity of material depends?

b)Write the SI unit of resistivity

c)Name the material which act as best conductor?

d)Name the material which is used to make of filament in the electric lamp?

e)Name the material which is used to make the heating elements of irons, toasters ?

f) Name the materials which are used to make diodes, transistors and integrated circuits?

g)Name the two factors on which the resistivity of a substance does not depend?

h)Write the equation to show the relation between resistance and resistivity of the material?

i)Which of the material do not oxidise easily either Nickel or Nichrome

j) Name the metals present in Nichrome?

27) Observe the figure and answer the questions
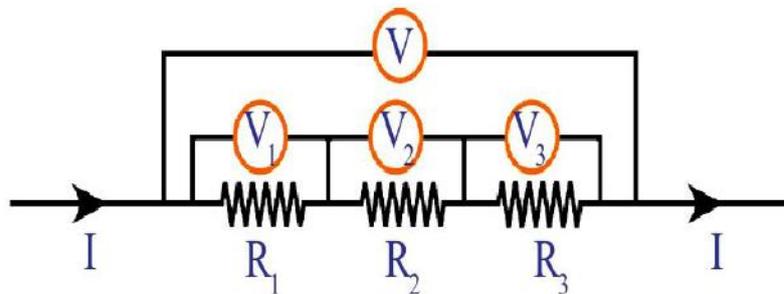
a) Are all the resistors connected in series or parallel

b) What is the equivalent resistance of the combination of three resistors

c) In this system, which physical quantity is constant

d) If R_1= 2 Ω, R_2= 3 Ω and R_3=6 Ω, then find equivalent resistance

28) Observe the figure and answer the questions
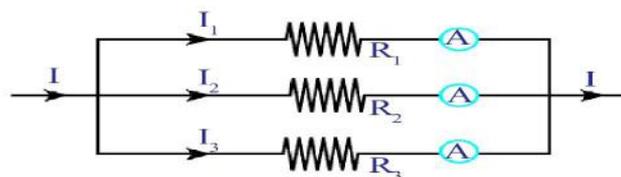
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c) In this system, which physical quantity is constant

d) If R_1= 2 Ω, R_2= 3 Ω and R_3=6 Ω, then find equivalent resistance

29) Observe the circuit and answer the questions given below
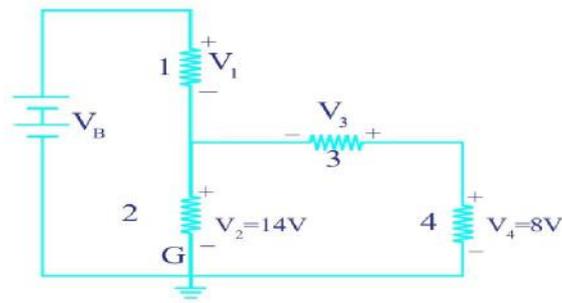
a) Are resistors C and D in series ?

b) Are resistors A and B in series ?

c) Is the battery in series with any resistor?

d) What is the potential drop across the resistor C?

e) What is the total emf in the circuit if the potential drop across resistor A is 6V?
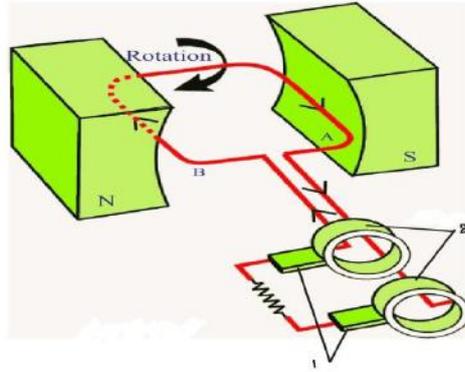
30) Observe the figure and answer the questions
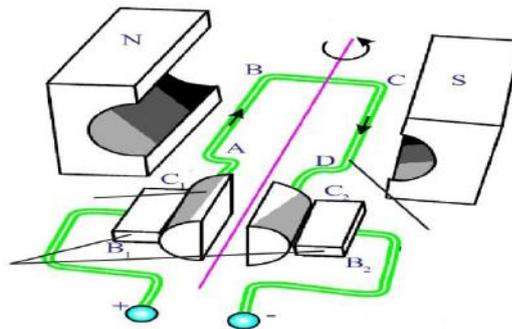
a) Name the diagram shown in the above figure?

b) Name the electrical device which converts electrical energy into mechanical energy?

c) What is the functioning of commutator?

d) What is the nature of magnetic field between N and S poles ?

e) What happens when a current carrying coil is placed in a uniform magnetic filed?

f) What is the direction of magnetic force on side AB of coil?

g) What is the direction of magnetic force on side CD of coil?

h) What is the direction of magnetic force on side BC of rectangular coil ABCD?

i) Does the coil rotate in clockwise or anti clockwise direction ,when the current flows through the coil in the direction ABCD?

j) Does the coil rotate in clockwise or anti clockwise direction ,when the current flows through the

coil in the direction DCBA?

k)What happens to the rotation of the coil,when the ends of the coil are connected to slip-rings instead of split-rings?

31) Observe the figure and answer the questions

a)Name the diagram shown in the above figure?

b)Name the parts labeled as 1 and 2 in the above figure?

c)Name the device which converts mechanical energy into electrical energy ?

d)What happens when a coil is continuously rotated in a uniform magnetic field?

e)By which law we can find the direction of induced current generated in the coil?

f)State lenz's law?

g)Name the current generated through the device shown in the above figure?

h)How can we get DC current using generator?

32) Observe the figure and answer the questions
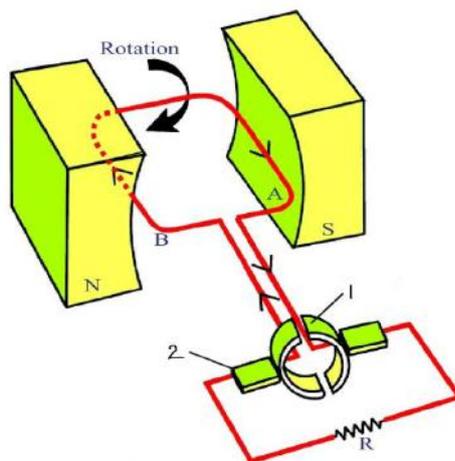
a) Name the diagram shown in the above figure?

b) Name the parts labeled as 1 and 2 in the above figure?

c)What changes do we need to make in an DC generator to be converted into AC generator?

d)Name the current generated through the device shown in the above figure?

33) Observe the table and answer the questions

ORE	Formula	metal	ORE	Formula	metal
Bauxite	$(Al_2O_3\,2H_2O)$	Al	Zincite	(ZnO)	Zn
Copper Iron Pyrites	$(CuFeS_2)$	Cu	Rock salt	$(NaCl)$	Na
Zinc Blende	(ZnS)	Zn	Cinnabar	(HgS)	Hg
Magnesite	$(MgCO_3)$	Mg	Magnetite	(Fe_3O_4)	Fe
Epsom salt	$(MgSO_4\,7H_2O)$	Mg	Galena	(PbS)	Pb
Horn Silver	$(AgCl)$	Ag	Gypsum	$(CaSO_4\,2H_2O)$	Ca
Pyrolusite	(MnO_2)	Mn	Lime stone	$(CaCO_3)$	Ca
Haematite	(Fe_2O_3)	Fe	Carnallite	$(KCl\,MgCl_2\,6H_2O)$	Mg

a)Give two examples for sulphide ores?

b)Which method is used for concentration of Galena?

c)What is method used to convert Zinc blend to an oxide ore?

d)What is the method used to convert Magnesite into an oxide ore?

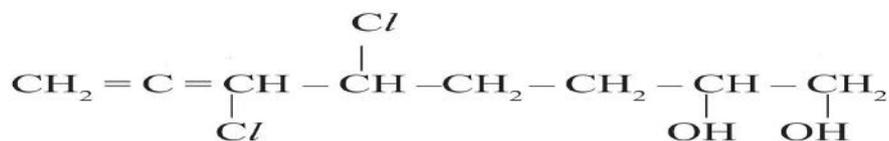e)What is the metal present in Rock salt ?

f)Which furnace is useful in extraction of Iron from Haematite?

g)What is the ore of Aluminium?

h)Which metal can be extracted from Cinnabar?

i) What are metals present in Carnalite?

34) Observe the structure and answer the questions

$$CH_2 = C = CH - \overset{\overset{\displaystyle Cl}{|}}{CH} - CH_2 - CH_2 - \overset{\overset{\displaystyle OH}{|}}{CH} - \overset{\overset{\displaystyle OH}{|}}{CH_2}$$
with Cl below the second carbon

a)What is the root word in the compound?
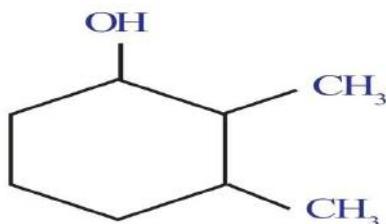
b)What is the functional group in the compound?

c)What is the name of the compound?

d)Which number is assigned for –OH group in the compound?

e)In which direction the numbering should be given?

f)Is it an unsaturated compound. If Yes,why?

35) Observe the strucure and answer the questions

a)What is the functional group present in the compound?

b)What is the primary prefix in the compound?

c)What is the root word in the compound?

d)For which carbon do you assign number 1 ?

e)What is the name of the compound?

f)What is the suffix used for the functional group in IUPAC?

g)What type of reaction this compound would participate?

AS₅ (Communication through drawing, model making)

1) Draw a neat diagram showing acid solution in water conducts electricity.

2)Draw a p^H scale and label acids, bases and salts on the scale (OR) Draw a p^H values by different colour in universal indicator

3)Draw a diagram of arrangement of apparatus for the reaction of acids and bases with metals

4)Draw a diagram of arrangement of apparatus for the reaction of acids with carbonates and metal hydrogen Carbonates

5) Explain the refraction of light through a glass slab with a neat ray diagram

6)Draw ray diagrams for the Convex lens following positions and explain the nature and position of image.

a) At infinity b) Object is placed at beyond C_2 c) Object is placed at C_2

d)Object is placed between F_2 and C_2 e)Object is placed at F_2

f)Object is placed between F_2 and optic centre

7) Draw the ray diagrams for Concave lens following positions and explain the nature and position of

image

a) At infinity b) Between Optic centre and infinity

8)Draw the diagrams showing the eye defect of Myopia and correction with suitable lens

9) Draw the diagrams showing the eye defect of Hypermetropia and correction with suitable lens

10)Draw the shapes of s,p and d orbitals

11)Draw the moeller diagram showing the increasing order of (n+l) values

12)Which electric device converts electric energy into mechanical energy? Draw a neat diagram and label the parts

13) Which electric device converts mechanical energy into electrical energy? Draw a neat diagram and label the parts

14) Draw the diagram of AC generator and label the parts

15)Draw the diagram of DC generator and label the parts

16) Which furnace used to pyrochemical process Roasting? Draw this furnace and label the parts

17)Draw the diagram showing froth floatation process. Which ores are concentrate in this process?

18)Draw the diagram showing the magnetic separation method. What ores are dressed by this method?

All the best……

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