Important Questions for SSC Public Examinations-2021
PHYSICAL SCIENCE
Chapter-1(HEAT)

➢ **4 Marks Questions**

1. Write the difference between heat and temperature (AS1)
2. Explain the procedure of finding specific heat of solid experimentally. (AS3)
3. Observe the table and answer the following questions (AS4)

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 Marks Questions**

1. Define specific heat and write its units. (AS1)
2. Write the formula of specific heat and explain the terms in it (AS1)
3. How do you appreciate the role of the higher specific heat of water in stabilizing atmospheric temperature during winter and summer seasons? (AS6)
4. What role does specific heat play in keeping a watermelon cool for a long time after Removing it from a fridge on a hot day? (AS6)

➢ **1 Mark Questions**

1. Covert 20^0 C into Kelvin scale.(AS1)
2. Write the formula of specific heat (AS1)
3. Define temperature (AS1)
4. State the principle of method of mixtures.(AS1)
5. Why does transfer of heat energy take place between objects (system) ? (AS2)

➢ **½ Mark Questions**

1. SI unit of heat is ____
2. 1 cal = _____ joule
3. Which device you select to measure the specific heat of a solid in the laboratory?
4. If the temperature of a steel rod is 300K, then its temperature in ^{0}C is_____
   A) 55^0C B) 57^0C C) 59^0C D) 53^0C
5. What is the S.I unit of specific heat?
6. If initial temperatures of the two samples of masses m1 and m2 be T1 and T2, then what is the final temperature of the mixture (T) is

7. The oceans behaves like heat _____ for earth

Chapter-2 (ACIDS,BASES & SALTS)

➢ 4 Marks Questions

1. Why does tooth decay start when the pH of mouth is lower than 5.5? (AS1)
2. Compounds such as alcohols and glucose contain hydrogen but are not categorized as acids. Describe an activity to prove it.(AS3)
3. Show that acids produce hydrogen gas when react with metals (AS3)
4. Observe the table and answer the following questions (AS4)

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?

5) Complete the following table (AS4)

S.NO	Sample solution	Red litmus paper	Blue litmus paper	Phenolphthalein solution	Methyl orange solution
1	HCl				
2	NaOH				

6. Draw a neat diagram showing acid solution in water conducts electricity. (AS5)

➢ 2 Marks Questions

1. What is a neutralization reaction? Give two examples. (AS1)
2. Why does not distilled water conduct electricity? (AS2)
3. Why pure acetic acid does not conduct electricity ? (AS2)
4. How does the flow of acid rain into a river make the survival of aquatic life in a river difficult? (AS6)

➢ 1 Mark Questions

1. What happens when an acid or base is mixed with water? (AS1)
2. Define p^H scale (AS1)
3. Why pure acetic acid does not turn blue litmus to Red? (AS2)
4. What is range of p^H scale? (AS1)

➢ ½ Mark Questions

1. The colour of phenolphthalein indicator in basic solution is _____
   A) Yellow B) Green C) Pink D) Orange
2. Complete the following equation
   Acid + Base → Salt + _____
3. Which gas evolves when acids react with metals?
4. What is the nature of non-metal oxides?
5. Match the following
   P) p^H of Acid rain ( ) X) Lower than 5.5
   Q) p^H of Tooth decay ( ) Y) Less than 5.6
   ( ) Z) Greater than 5.6
6. If base dissolves in water it is called as [ ]
   A) neutralization B) base C) acid D) alkali
7. Which gas evolves, when metal carbonate or metal hydrogen carbonate react with acids [ ]
   A) Hydrogen B) Oxygen C) Nitrogen D) Carbon dioxide

8. Is the substance present in antacid tablet acidic or basic?

Chapter-3 (REFRACTION OF LIGHT AT PLANE SURFACES)

➢ 4 Marks Questions

1. How do you verify experimentally that sin i /sin r is a constant? (AS3)
2. Define the following terms (AS1)
   A) Refractive index B) Laws of refraction
3. Observe the following table and answer the questions (AS4)

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

➢ 2 Marks Questions

1. When we sit at camp fire, objects beyond the fire are seen swaying. Give reason for it.
2. Why is it difficult to shoot a fish swimming in water? (AS6)
3. On what factors does the refractive index of medium depend? (or) What are the factors that influence the refractive index (AS1)
4. In What cases does a light ray not deviate at the interface of two media? (AS6)

➢ 1 Mark Questions

1. What is refraction (AS1)
2. Why does ray of light bent when it travels from one medium to another (AS2)
3. Refractive index of glass relative to water is 9/8. What is the refractive index of water relative to glass? (AS1)
4. What is the cause of refraction of light? (AS1)

➢ ½ Mark Questions

1. X: Refractive index n=c/v
   Y: Refractive index has no units
   A) Both are correct B) X is correct, Y is wrong
   C) X is wrong, Y is correct D) Both are wrong
2. Which of the following is Snell's law
   A) $n_1 \sin i = \sin r/n_2$ B) $n_1/n_2 = \sin r/ \sin i$
   C) $n_2/n_1 = \sin r/ \sin i$ D) $n_2 \sin i$ = constant
3. ASSERTION : It is difficult to shoot a fish swimming in water .
   REASON : Due to refraction fish in water change its original position.

A) A –TRUE,R-FALSE B) A –FALSE,R-TRUE C) A –FALSE,R-FALSE D) A –TRUE,R-TRUE

4. When a light ray travel from denser to rarer medium along with the normal
   a) It bends towards the normal b) It moves away from the normal c) It is an undeviated
5. What is the SI unit of refractive index?
   A) m/s B) m/s^2 C)kg-m/s D) No unit
6. Write the value of the speed of light in vacuum
7. In which case Snell's law is not applicable?

Chapter-4 (REFRACTION OF LIGHT AT CURVED SURFACES)

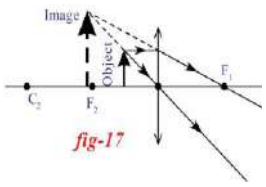
➢ 4 Marks Questions

1. Draw ray diagrams for the following positions of convex lens? (AS5)
   A) Object is placed at F_2 B) Object is placed at $2F_2$ (practice remaining cases)
2. Fill the following table, which is related to convex lens (AS4)

Position of the Object	Position of the Image	Real/Virtual image	Inverted/Erected image	Enlarged/Diminished image
Beyond 2F2			Inverted	Diminished
	Beyond 2F1	Real		Enlarged
At F_2	Infinity		Inverted	
	Same side of the Object		Erected	Enlarged

➢ 2 Marks Questions

1. Frame any two questions to understand difference between convex lens and concave lens (AS2)
2. What is a lens? (AS1)
3. The Information given from the above figure, answer the following questions. (AS4)
   i) Write the nature of the image?
   ii) What is the lens shown in the figure?



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➢ 1 Mark Questions

1. Write lens formula (AS10
2. Write the behavior of a light ray when it is passing through the optic centre of a convex lens (AS2)
3. Which lens is called converging lens? (AS1)

➢ ½ Mark Questions

1. The midpoint of a thin lens is called _____
   A) Centre of curvature B) Optic centre C) Focus D) Radius of curvature
2. Which one of the following materials cannot be used to make a lens?
   A) water B) glass C) plastic D) clay
3. Which lens can form Real and Virtual image ?
4. P: Light ray passing along the principal axis is un deviated.
   Q: Light ray passing through the focus is un deviated.
   A)P,Q both are correct B)P is correct, Q is incorrect
   C)P in correct, Q is correct D)P,Q both are incorrect
5. In which situation, the value of focal length of a convex lens is equal to the value of image distance
6. Which lens is called converging lens?
7. What we call when a line joins the centre of curvature and the pole of a curved surfaces?

Chapter-5 (HUMAN EYE AND COLOURFUL WORLD)

➢ 4 Marks Questions

1. How do you correct the eye defect Myopia?(AS1)
2. Explain the correction of the eye defect Hypermetropia. (AS1)

➢ 2 Marks Questions

1. Define power of lens and write their unit (AS1)

2. How many types of eye defects ? What are they? (AS1)
3. "A doctor advised to Ravi to use -2D lens for his effect". Based on this Information answer the questions given below. (AS4)
   a) Identify the eye defect of Ravi b)Find the focal length of lens. (OR)
   A boy who is suffering from eye defect has been given a prescription as -2D. Based on the information given, answer the following questions
   a) Identify the eye defect he is suffering b) Write the nature and focal length of the lens
4. Ammalu can see the name boards of Buses clearly from long distance. But she cannot read newspaper clearly.(AS2)
   i) What type of eye defects does Ammalu have?
   ii) What kind of lens does Ammalu use to correct her eye defect?

➢ **1 Mark Questions**

1. How do you correct the defect Presbyopia? (AS1)
2. Give the values of maximum and minimum focal length of eye lens ? (or) What are the limits to change the focal length of eye lens? (AS1)
3. A person is suffering from myopia, his far distance is 5 m. what is the focal length of his eye lens (AS2)
4. Define angle of vision (AS1)

➢ **½ Mark Questions**

1. What is the maximum focal length of the human eye lens?
2. Matching
   X) Least distance of distinct vision ( ) P) 25 cm
   Y) Angle of vision ( ) Q) 30 cm
   ( ) R) 60^0
3. Doctors use biconvex lens to treat which eye defect? (or) A person is advised to wear spectacles with convex lens. What type of defect of vision is he suffering from?
4. Match the following

Section-A	Section-B
1. Myopia	a) Convex lens
2. Hypermetropia	b) Vision defect with age
3. Presbyopia	c) Concave lens

5. What is the value of least distance of distinct vision for healthy human being?
6. What is the value of angle of vision for healthy human being?
7. Write SI unit of power of lens

Chapter-6 (STRUCTURE OF ATOM)

➢ **4 Marks Questions**

1. Explain the significance of three Quantum numbers in predicting the positions of an electron in an atom.(AS1)
2. Draw the shapes of s and p orbitals (AS5)
3. Draw the shapes of d-orbitals (AS5)
4. State and explain with one example of Aufbau principle? (AS1)

➢ **2 Marks Questions**

1. Write the four quantum numbers for $1s^1$ electron (AS2)
2. An element is an atom has the following set of four quantum numbers (AS4)

n	l	m_l	m_s
2	0	0	+1/2

   i) Name of the element ii) Which orbital it belong to
3. State and explain Pauli's exclusion principle? (AS1)
4. What is nl^x method? How it is useful? (AS1)

➢ **1 Mark Questions**

1. Which rule is violated in the electric configuration $1s^0 2s^2 2p^4$?
2. What is shape of d-orbital?
3. Which quantum number gives size and energy of the main shell?

➢ **½ Mark Questions**

1. Which electronic shell is at a higher energy level K or L ?
2. L-shell : 8 : : M-shell : ☐
3. The *'l'* of value of p orbital is _____
   A) 0 B) 1 C) 2 D) 3
4. (n+*l*) value of 3d orbital is_____
5. The shape of p-orbital is_____
   A) Spherical B) Dumbell C) Double dumbell D) Double spherical
6. The arrangement of electrons in shells,sub-shells and orbitals of an atom is called _____
7. How many values can *'l'* have for n=4?

Chapter-7 (CLASSIFICATION OF ELEMENTS –THE PERIODIC TABLE)

➢ 4 Marks Questions

1. Discuss the construction of the long form of the periodic table.(AS1)
2. Explain how the elements are classified into s,p,d and f-block elements in the periodic table (AS1)

➢ 2 Marks Questions

1. Define "Dobereiner's law of traids" and give one example (AS1)

➢ 1 Mark Questions

1. Define the modern periodic law (AS1)
2. An element has atomic number 19. Where would you expect this element in the periodic table (AS2)
3. State Mendeleeff's periodic law (AS1)

➢ ½ Mark Questions

1. Lithium, _____ and Potassium constitute a Dobereiner's traid
2. Number of elements present in period-2 of the long form of periodic table
   A) 2 B) 8 C) 18 D) 32
3. Group of elements is also called _____
4. Matching
   A) Group-1 ( ) X) Halogens
   B) Group -18 ( ) Y) Alkali metals
   Z) Noble gases
5. Lanthanoids : 4f : : _____ : 5f
6. The first attempt classification of elements was made by _____
7. The incomplete period of the periodic table is _____

Chapter-8 (CHEMICAL BOND)

➢ 4 Marks Questions

1. Explain the formation of $BeCl_2$ molecule using hybridization.(AS1)
2. Explain the formation of BF_3 molecule using hybridization.(AS1)
3. Explain how formation of sodium chloride on the basis of the concept of electron transfer from one atom to another atom.(AS1)

➢ 2 Marks Questions

1. Define hybridization (AS1)
2. Explain the formation of N_2 molecule (AS1)
3. Explain the formation of O_2 molecule (AS1)

➢ 1 Mark Questions

1. Define octet rule (AS1)
2. Define chemical bond (AS1)

➢ ½ Mark Questions

1. Match the suitable answers of section-B with section-A

Section-A	Section-B
X) N_2	P) 120^0
Y) BF_3	Q) 180^0
	R) 3 bonds

2. What type of hybridization is present in BF_3 molecule?
3. Bond angle of $BeCl_2$ is ___
   A) 120^0 B) 109^028^1 C) 180^0 D) 104^031^1

4. What is shape of BF_3 molecule?

Chapter-9 (ELECTRIC CURRENT)

➢ 4 Marks Questions

1. State Ohm's law. Suggest an experiment to verify it and explain the procedure. (AS3)
2. Define the following terms (AS1)
   A) Electric current B) Resistance
3. How do you verify that resistance of a conductor is proportional to the length of the conductor for constant cross section area and temperature (AS3)
4. Observe the table and answer the following questions (AS4)

Material	$\rho_{(\Omega\text{-m})}$ 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?

➢ 2 Marks Questions

1. Write the materials required to conduct ohm's law verification experimentally (AS3)
2. Give examples for Ohmic conductors and non Ohmic conductors. (AS1)
3. Define Resistivity of a conductor ? (AS1)
4. What are the limitations of Ohm's (AS1)
5. Define electric current? Write its units? (AS1)

➢ 1 Mark Questions

1. What are factors which affect the resistance of a material? (AS1)
2. Draw the shape of V-I graph of Non-ohmic conductor.(AS5)
3. Define emf ?(AS1)
4. On what factors does the resistivity depend? (AS1)

➢ ½ Mark Questions

1. What is the shape of V-I graph of ohmic conductor?
2. joule/coulomb is the same as
   A) watt B) volt C) ampere D) ohm
3. Match the following

(X) 1 Ohm (P) 1 Colounb / 1 sec
(Y) 1 Ampere (Q) 1 Watt / 1 sec
(R) 1 Volt / 1 Ampere

(A) X-Q, Y-P, (B) X-R, Y-P (C) X-Q, Y-R (D) X-R,Y-Q

4. What happens to the resistance of a conductor, if we increase its length?
5. volt/ampere = _____
6. Matching

A) Potential difference ( ) X) volt
B) emf ( ) Y) ampere
Z) ohm

7. The S.I unit of resistivity is _____

Chapter-10 (ELECTROMAGNETISM)

➢ 4 Marks Questions

1. How can you verify that a current carrying wire produces a magnetic field with the help of experiment? (AS3)

➢ 2 Marks Questions

1. Write the materials required to conduct Oersted experiment (AS3)
2. Rajkumar said to you that the magnetic field lines are open and they start at north pole of bar magnet and end at south pole. What questions do you ask Rajkumar to correct him by saying " field lines are closed" ? (AS2)

➢ 1 Mark Questions

1. What is the flux through the plane taken parallel to the field? (AS2)
2. Define Magnetic flux (AS1)
3. Define magnetic flux density (AS1)

➢ ½ Mark Questions

1. weber/metre^2 =

A) Oersted B) Tesla C) Newton D) Watt

2. Write the formula of magnetic flux density.
3. Magnetic field is

A) one dimensional B) two dimensional C) three dimensional D) n-dimensional

4. Matching

A) Magnetic flux ( ) X) Tesla
B) Magnetic flux density ( ) Y) Weber
Z) Weber/metre^2

Chapter-11 (METALLURGY)

➢ 4 Marks Questions

1. Suggest an experiment to prove that the presence of air and water is essential for corrosion.Explain the procedure (AS3)

➢ 2 Marks Questions

1. Define a) Mineral b) Ore (AS1)

➢ 1 Mark Questions

1. Mention any one of methods of prevention of corrosion (AS1)
2. What is the name of the process of extraction of metals from their ores? (AS1)

➢ ½ Mark Questions

1. The impurity present in the ore is called as_____

A) Gangue B) Flux C) Slag D) Mineral

2. Name the phenomenon where in a metal such as iron is damage when exposed to moist air for a long time?
3. The most abundant metal in the earth's crust is ?

A) Sliver B) Aluminum C) Gold D) Iron

4. Bauxite is an ore of _____

Chapter-12 (CARBON AND ITS COMPOUND)

➢ 4 Marks Questions

1.Observe the table and answer the following questions (AS4)

Alkane	Methane	Ethane	Propane	Butane

Molecular formula	CH_4	C_2H_6	C_3H_8	C_4H_{10}

a) What is the general formula of Alkanes?
b) Write the molecular formula of next alkane comes after Butane?
c) How many carbons in Pentane?
d) How many bonds present in Methane?

- **2 Marks Questions**

1. What is "catenation" (AS1)
2. Name the following hydrocarbons (AS2)
   a) C_2H_4 b) C_2H_2
3. What is the specialty of Carbon? (AS1)

- **1 Mark Questions**

1. Write the general formula of Alkenes? (AS1)
2. What do we call the self linking property of carbon? (AS1)

- **½ Mark Questions**

1. Name the simplest hydrocarbon?
2. Write the electronic configuration of carbon atom.
3. Atomic number of carbon is _____

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