SUMMATIVE ASSESSMENT-I

(2019-2020)

GENERAL SCIENCE-Paper-I

10th Physical Science

Principle of Evaluation

Section-I

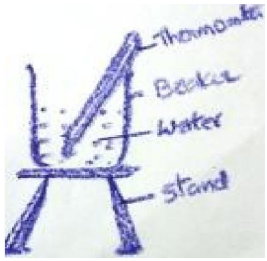
12X1/2=6 M

1. The degree of hotness or coldness
2. d
3. Between 11 and 12
4. $CaOCl_2$
5. Centre of Curvature
6. $n_1 \sin i = n_2 \sin r$
7. Power(p)=1/f=1/2=0.5 D
8. Scattering of light
9. a
10. Refraction of light
11. a
12. Water

Section-II

8X1=8 M

13.



14.The reaction of an acid with a base to give a salt and water is known as a neutralization reaction

15. i)It is used as soda-acid in fire extinguishers ii)It is acts as mild antiseptic

16.To change the refractive indices of their medium, resulting change the speed

17.1/f=1/v-1/u

18.Virtual, Erect and enlarged image

19. Virtual,Erect and Diminished image

20.Using in telescope (Write any one of use)

Section-III

8X2=16 M

21. $Na_2CO_3 + 2HCl \rightarrow 2HCl + H_2O + CO_2$

$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$

22.Refractive index of diamond(2.42) is more than refractive index vacuum(1).Speed of light depend on refractive index, So light ray travel slowly in diamond when compared to vacuum.

23. $R_1=R_2=R$, n=1.5 f=?

$1/f=(n-1)[1/R_1+1/R_2]=(1.5-1)[1/R+1/R]=1/2x2/R=1/R$

$f=R$

24. $1/f=(n-1)[1/R_1+1/R_2]=(n-1)[1/R+1/R]=(n-1)x2/R$

25.The light from the sun needs to travel more distance in atmosphere during sinrise and sunset to reach your eye. In morning and evening times, during sunrise and sunset ,expect red light all colours scatter more and vanish before they reach you. Since scattering of red light is very small,it reaches you

26. $\lambda=1m$, $C=3x10^8$ m/s , $v=?$

$v=C/\lambda=3x10^8/1=3x10^8$ Hz

27.The short hand notation of electronic configuration is nl^x

i) It is used to write the electronic configuration of an atom

ii) It is used to find the position of electrons around the nucleus in at atom

28.With help of ciliary muscle to change the focal length of eye lens

Section-IV

5X4=20

29.

. **Aim :** To find the specific heat of given solid.

Material required : Calorimeter, thermometer, stirrer, water, steam heater, wooden box and lead shots.

Procedure :

1) Measure the mass of the calorimeter with stirrer = m_1 gm
2) Fill water one third volume of calorimeter and measure the mass = m_2 gm.
3) At this time initial temperature = T_1.
4) Mass of the water = $m_2 - m_1$ gm.
5) Take a few lead shots in steam heater and heat up to 100° C. Let this temperature be T_2.
6) Pour the lead shots into calorimeter and measure the final (or) resultant temperature T_3.
7) Mass of calorimeter with contents = m_3 gm and mass of lead shots = $m_3 - m_2$ gm.
8) If the specific heats of the calorimeter, lead shots and water are S_c, S_l and S_w respectively.
9) By using method of mixtures we have
   Heat lost by the solid = Heat gained by the calorimeter + water

$$(m_3 - m_2)\, S_l\, (T_2 - T_3) = m_1\, S_c\, (T_3 - T_1) + (m_2 - m_1)\, S_w\, (T_3 - T_1)$$

$$S_l = \frac{[m_1 S_c + (m_2 - m_1)\, S_w]\,(T_3 - T_1)}{(m_3 - m_2)\,(T_2 - T_3)}$$

10) By Knowing the specific heats of calorimeter and water we can calculat specific heat of solid (lead shots).

1 Mark

(OR)

Evaporation	Boiling
1. The process of escaping of molecules from the surface of a liquid at any temperature is called evaporation.	1. The process in which the liquid phase changes to gaseous phase at constant temperature is called boiling.
2. Evaporation takes place at any temperature.	2. Boiling takes place at a definite temperature. This is called boiling point of that liquid.
3. The temperature of the system gets down.	3. The temperature of the system increases upto boiling point.
4. The evaporation depends on the surface area, humidity, temperature wind speed.	4. The boiling depends on the nature of substance.
5. **Eg :** 1) Wet clothes dries. 2) Sea water evaporates to form clouds.	5. **Eg :** 1) Water boils at 100° C.

30.

When the angle of incidence is greater than critical angle, the light ray reflected into denser medium at interface, i.e. light never enter to rarer medium. This phenomenon is called total internal reflection.

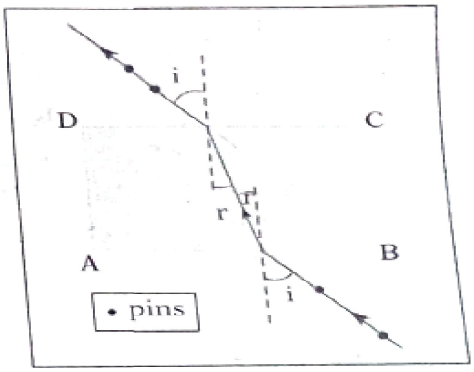
1) **Brilliance of diamonds :** Total internal reflection is the main cause for brilliance of diamonds. The critical angle of diamonds is very low (24.4°). So if a light ray enters into a diamond it is very likely to get total internal reflection which makes the diamond shine brilliant.
2) **Optical fibres :** Total internal reflection is the basic principle for working of optical fibre.
3) **Mirage :** Mirage is an optical illusion where it appears that water is collected on the road at a distant place but when we get there, the road is dry.

(OR)

Aim:-To find the lateral shift using glass slab

Materials required:- Plank, chart paper, clamps, pencil,scale, thin glass and pins

Procedure :



1) Place a piece of chart on a plank. Clamp it. Place a glass slab in the middle of the paper.
2) Draw border line along the edges of the slab by using a pencil. Remove it. You will get a figure of a rectangle.
3) Name the vertices of the rectangle as A, B, C and D.
4) Draw a perpendicular to one of the longer sides (AB) of the rectangle.
5) Now draw a line from the point of intersection where side AB of rectangle and perpendicular meet, in such a way that it makes 30° angle with the normal.
6) This line represents the incident ray falling on the slab and the angle it makes with normal represents angle of incidence.
7) Now place the slab on the paper in such a way that it fits in the rectangle drawn. Fix two identical pins on the line making 30° angle with normal, such that they stand vertically with same height.
8) By looking at the two pins from the other side of the slab, fix two pins in such a way that all pins appear to be along a straight line.
9) Remove the slab and take out pins. Draw a straight line by joining the dots formed by the pins up to the edge CD of the rectangle.
10) This line represents emergent ray of the light.
11) Draw a perpendicular to the line CD where our last line drawn meets the line CD.
12) Measure the angle between emergent ray and normal.
13) This is called angle of emergence.
14) The angle of incidence and angle of emergence are equal.
15) Incident emergent rays are parallel.
16) The distance between the parallel rays is called shift.

31.

Principal Quantum number (n) is related to size and energy of the main shell, takes the values from 1,2,3, ...

The angular momentum quantum number (l) is related to the shape of a particular sub-shell. 'l' has the values from 0, 1, 2, ... The maximum value of l is (n – 1) for a given 'n' value.

The value of magnetic quantum number (m_l) describes the orientation of the orbital in space relative to the other orbitals in the atom. The values of m_l range from $-l$ to $+l$, including zero.

Spin quantum number (m_s) refers to two possible orientations of the spin of electron, one clockwise and the other anticlockwise spin. These are represented by $+\frac{1}{2}$ and $-\frac{1}{2}$.

(OR)

Aufbau principle : Orbitals are filled in the order of increasing energy.

Two general rules help us to predict electronic configuration.

1) Electrons are assigned to orbitals in order of increasing value of $(n + l)$.
2) For sub-shells with the same value of $(n + l)$, electrons are assigned first to the sub-shell with lower 'n'.

Ascending order of energies of various atomic orbitals is given below :

$1s < 2s < 2p < 3s < 3p < 4s < 3d < 4p < 5s < 4d < 5p < 6s < 4f < 5d < 6p < 7s < 5f < 6d < 7p < 8s$ ...

Pauli's exclusion principle : According to Pauli's exclusion principle, no two electrons of the same atom can have all four quantum numbers are same.

Ex : He (Z = 2)

The electronic configuration is $1s^2$. i.e. 

$1s^2$

The set of four quantum numbers for two electrons of Helium atom is

	n	l	m_l	m_s
1st electron	1	0	0	+ ½
2nd electron	1	0	0	− ½

From the table we can observe that the three quantum numbers are equal but fourth one is different.

32.

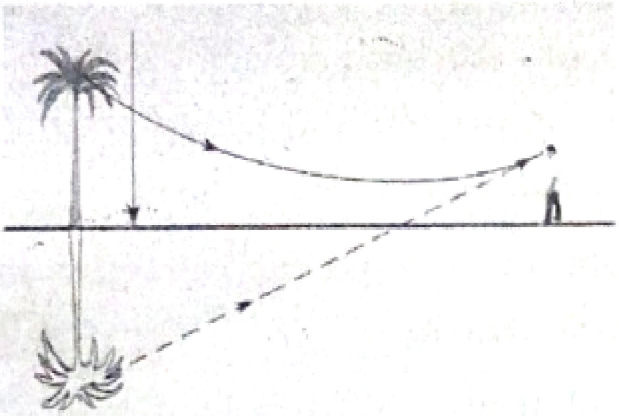
Activity to produce a rainbow in classroom :

1) Take a prism and place it on the table near a vertical white wall.
2) Take a thin wooden plank, make a small hole in it and fix it vertically on the table.
3) Place the prism between the wooden plank and wall.
4) Place a white light source behind the hole of the wooden plank. Switch on the light.
5) Adjust the height of the prism such that the light falls on one of the lateral surfaces.
6) Observe the changes in the emerged ray of the prism.
7) Adjust the prism by slightly rotating it till you get an image on the wall.
8) We observe a band of different colours on the wall.
9) These colours are nearly equal to the colours of the rainbow, i.e., VIBGYOR.

(OR)

1. Mirages is an optical illusion it appears that water has collected on the road at a distance place but when we get there, we don't find any water

2) During a hot summer day, air just above the road surface is very hot and the air at higher altitudes is cool.
3) As a result density of air increases with height, hence refractive index of air increases with density.



Refractive index decreases with depth

4) So, the cooler air at the top has greater refractive index than hotter air just above the road.
5) When the light from a tall object such as tree or from the sky passes through a medium just above the road, whose refractive index decreases.
6) If we take any two layers of air, light incident an angle *i*, upper layer works as denser medium and lower layer works as rarer medium. So light refracts far away from the normal.
7) Light rays passes through down layers, at particular layer i > c, light is completely reflected due to total internal reflection. (DE)
8) The refracted ray reaches the observer and appears as if the ray is reflected from the ground.
9) Hence we feel illusion of water being present on the road which is the virtual image of sky and an inverted image of tree on the road.

33.

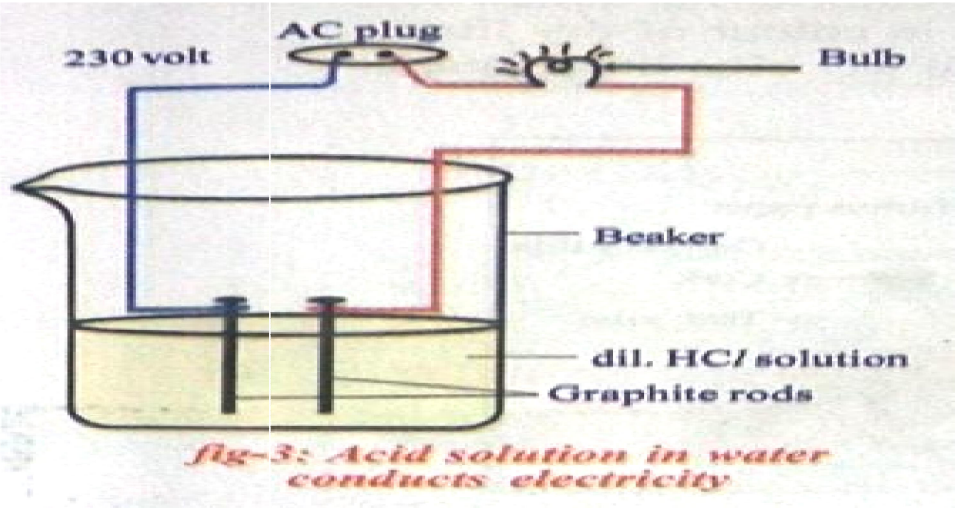


fig-3: Acid solution in water conducts electricity

(OR)

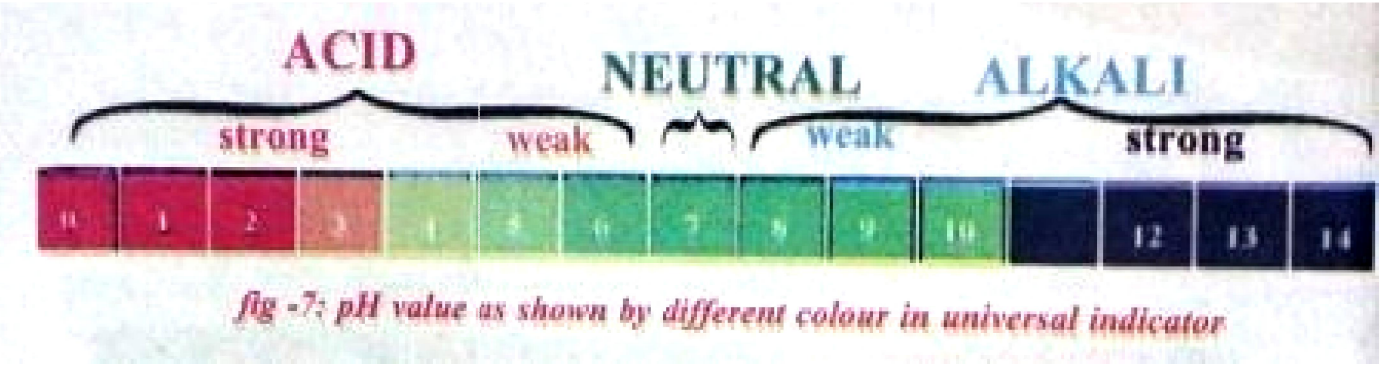


fig -7: pH value as shown by different colour in universal indicator

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