PRAKASAM DISTRICT COMMON EXAMINATION BOARD

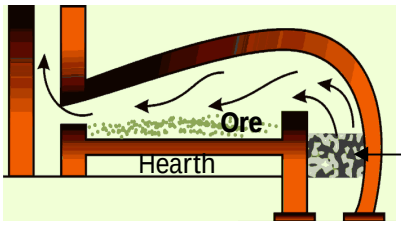
PRE PUBLIC EXAMINATIONS-FEBRUARY-2015

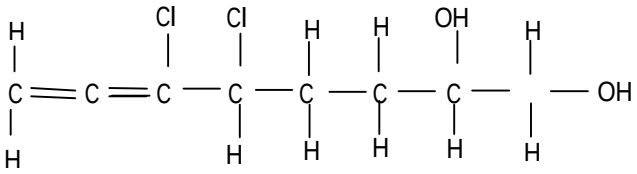
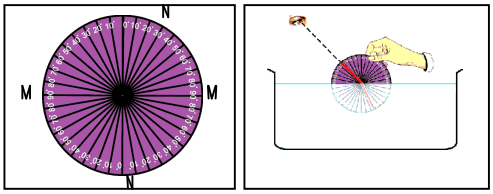
GENERAL SCIENCE , Paper – I

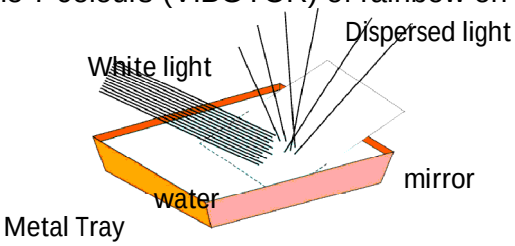
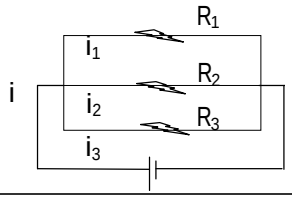
(Physical Sciences)

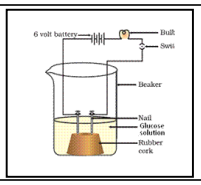
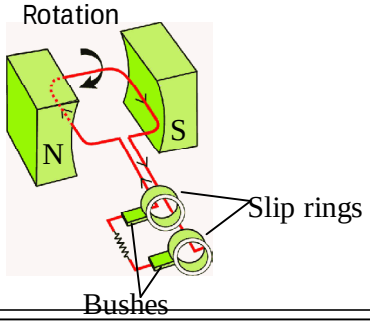
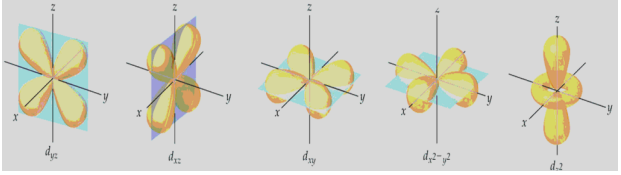
(English Version)

Class-10 - Principles of Evaluation - PART-A

<table>
<tr><th>Q.No</th><th>Points for Evaluation</th><th>Marks allotted</th><th>Total Marks</th></tr>
<tr><td>1.</td><td>Watermelon consists of more water and it has greater specific heat value.
So watermelon takes long time to rise in its temperature.</td><td>2x 1</td><td>2</td></tr>
<tr><td>2.</td><td>
<table>
<tr><th></th><th><u>Convex Mirror</u></th><th></th><th><u>Concave Mirror</u></th></tr>
<tr><td>1</td><td>This is a spherical mirror whose reflecting surface is curved outward is called convex mirror.</td><td>1</td><td>This is a spherical mirror whose reflecting surface is curved inward is called called concave mirror.</td></tr>
<tr><td>2</td><td>The focus lies behind the mirror.</td><td>2</td><td>The focus lies infront of the mirror.</td></tr>
<tr><td>3</td><td>diverging mirror.</td><td>3</td><td>converging mirror.</td></tr>
<tr><td>4</td><td>forms virtual images.</td><td>4</td><td>form virtual and also real images.</td></tr>
<tr><td>5</td><td>forms small images.</td><td>5</td><td>forms different size images.</td></tr>
<tr><td>6</td><td>forms erect images.</td><td>6</td><td>form erect and also invert images.</td></tr>
<tr><td>7</td><td>forms image behind the mirror.</td><td>7</td><td>form image behind and also infront of the mirror.</td></tr>
</table>
</td><td>Any two points related
2x1</td><td>2</td></tr>
<tr><td>3.</td><td>The oil occupies the gaps in the papers when it stained.
If the refractive indices of both paper and oil are exactly equal, then it becomes transparent. Generally oil paper is translucent.</td><td>2x 1</td><td>2</td></tr>
<tr><td>4.</td><td>* This law was used in security systems in air port s….
* The tape recorder which we use to listen to songs (or) record voices works on the principle of electromagnetic induction.
* The principle is used in the case of using ATM card when its magnetic strip is swiped through a scanner.
* An induction stove works on the principle</td><td>Any two points related
2x1</td><td>2</td></tr>
<tr><td>5.</td><td>It helps to slow down the oxidation process.
It does not allow the spoiling of food items.</td><td>2x 1</td><td>2</td></tr>
<tr><td>6.</td><td>* for making toys. * making materials for decoration
* making surfaces smooth. * plaster for fractured bones.
* for ceiling the roof in houses to protect from heat.
* manufacture of Gypsum.</td><td>Any two points related
2x1</td><td>2</td></tr>
<tr><td>7.</td><td> 
</td><td>Fig + Parts
1+1</td><td>2</td></tr>
</table>

<table>
<tr><td>8.</td><td>  </td><td></td><td>2</td></tr>
<tr><td>9.</td><td>Heat energy required to change unit mass of substance from a solid state to liquid state, without rising in temperature</td><td></td><td>1</td></tr>
<tr><td>10.</td><td>The reciprocal of focal length is called power of lens.
The unit of power is dioptre.</td><td>$2x\frac{1}{2}$</td><td>1</td></tr>
<tr><td>11.</td><td>Kirchhoff,s Junction law.</td><td></td><td>1</td></tr>
<tr><td>12.</td><td>$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$</td><td></td><td>1</td></tr>
<tr><td>13.</td><td>It gives the size and energy of an orbit.</td><td>$2x\frac{1}{2}$</td><td>1</td></tr>
<tr><td>14.</td><td>The impurities present in the ore is called gangue.</td><td>1x1</td><td>1</td></tr>
<tr><td>15.</td><td>  </td><td>1</td><td rowspan="2">4</td></tr>
<tr><td></td><td>Take a circular metal disc. Mark two perpendicular lines MM and NN. Then mark the angles from 0^o to 90^o on both sides of the line NN. Repeat the same on the other side of the line NN. Arrange two straws at the centre of the disc. Adjust one of the straws to make an angle 10^0 with the normal NN (i). Immerse half of the disc vertically into the water, filled in a transparent vessel. (MM coincides the surface of the water) From the top of the vessel try to view the straw which is inside the water. Then adjust the other straw which is outside the water until both straws appear to be in a single straight line. Then take the disc out of the water and observe the two straws on it. Measure the angle between the normal and second straw. (r). Note down the angle of incidence and angle of refraction in the table. Do the same for various angles like15^o, 20^o, 25^o, 30^o, 35^o and 40^o. Find the corresponding angles of refraction and note them.
<table>
<tr><th>Sl. No.</th><th>(i)</th><th>(r)</th></tr>
<tr><td>1</td><td>10^o</td><td></td></tr>
<tr><td>2</td><td>15^o</td><td></td></tr>
<tr><td>3</td><td>20^o</td><td></td></tr>
</table>
We observed that the angle of refraction(r) is always greater than the angle of incidence (i).</td><td>3x1=3</td></tr>
<tr><td>16.</td><td>centre of curvatures of convexo-concave lens are R_1 and R_2
Given that $R_2 = 2R_1$
Focal length of lens (f) = 24cm
Refractive index of the lens (n) = 1.5</td><td>1</td><td></td></tr>
</table>

	Lens maker's formula : $\frac{1}{f}$ = (n -1)$\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$	1	4
	for convexo-concave lens R_1 is positive and R_2 is positive. ➔ $\frac{1}{f}$ = (n -1)$\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$ ➔ $\frac{1}{24}$ = (1.5 -1)$\left(\frac{1}{R_1} - \frac{1}{2R_1}\right)$	1	
	➔ $\frac{1}{24}$ = (0.5)$\left(\frac{2-1}{2R_1}\right)$ ➔ $2R_1 = 12$ ➔ $R_1 = 6cm$ $R_2 = 2R_1 = 12cm$	1	
17.	Take a metal tray and fill it with water. Place a mirror such that it makes an angle to the water surface. Keep a white card board screen/sheet above the water surface. Now focus white light on the mirror through water. Try to obtain the colours on the screen. We can see the 7 colours (VIBGYOR) of rainbow on screen.  	6x $\frac{1}{2}$ = 3 Figure 1	4
18.	 	1	4
	Let R_1, R_2 and R_3 resistances connected in parallel The current through them is i_1, i_2 and i_3 respectively. The total voltage difference is V is fixed in this circuit.	1	
	Ohm's law : V = iR ➔ i = $\frac{V}{R}$ Apply Ohm's law , then $i_1 = \frac{V}{R_1}$, $i_2 = \frac{V}{R_2}$, $i_3 = \frac{V}{R_3}$	1	
	If the total current in the circuit is 'i' then $i = i_1 + i_2 + i_3$ $i = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$ ➔ $\frac{V}{R} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$ ➔ $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$	1	
19.	Prepare solutions of glucose, alcohol, hydro chloric acid and sulphuric acid etc.,Connect two different coloured electrical wires to graphite rods separately in a 100 ml beaker. Connect free ends of the wire to 6V battery through a bulb & a switch. Pour some dilute HCl in the beaker and switch on the current. Repeat activity with other solutions separately. The bulb glows only in acid solutions but not in other solutions. Glowing of bulb indicates that there is flow of electric current through the solution.	2	4
	Acid solutions have hydrogen ions and the moment of these ions in solution helps for flow of electric current through the solution. Alcohol and glucose contains hydrogen but not dissociates hydrogen ion in their aqueous solutions. So they are not categorized as acids.	1	

<table>
<tr><td></td><td> 
</td><td>1</td><td></td></tr>
<tr><td>20.</td><td>(a) (i) In periods, atomic radius decreases
(ii) In groups, atomic radius increases
(b) (i) In periods, I.P. do not follow any regular trend / increases
(ii) In groups, Ionization potential decreases
(c) (i) In periods, electron affinity increases.
(ii) In groups, electron affinity decreases.
(d) (i) In periods, Electro Negativity increases
(ii) In groups, Electro Negativity decreases</td><td>$8x\frac{1}{2}$</td><td>4</td></tr>
<tr><td>21.</td><td><table>
<tr><th></th><th><u>Ionic compounds</u></th><th></th><th><u>Covalent compounds</u></th></tr>
<tr><td>1</td><td>formed due to ionic bond</td><td>1</td><td>formed due to covalent bond</td></tr>
<tr><td>2</td><td>have high melting points.</td><td>2</td><td>have low melting points.</td></tr>
<tr><td>3</td><td>have high boiling points.</td><td>3</td><td>have low boiling points.</td></tr>
<tr><td>4</td><td>crystalline structure.</td><td>4</td><td>different shapes.</td></tr>
<tr><td>5</td><td>good electric conductors</td><td>5</td><td>poor electric conductors</td></tr>
<tr><td>6</td><td>good heat conductors.</td><td>6</td><td>poor heat conductors.</td></tr>
<tr><td>7</td><td>They ionize quickly</td><td>7</td><td>They does not ionize</td></tr>
<tr><td>8</td><td>Ex: NaCl, KCl</td><td>8</td><td>Ex: H_2O, NH_3</td></tr>
</table></td><td>4x1=4</td><td>4</td></tr>
<tr><td>22.</td><td>Alkanes are saturated hydrocarbons. So they participate in substitution reactions.
A reaction in which an atom or a group of atoms in a compound is replaced by other atom or group of atoms is called a substitution reaction.
Ex: Methane (CH_4) reacts with Cl_2 in the presence of sunlight.
$CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$
Methane — Methyl Chloride
$CH_3Cl + Cl_2 \rightarrow CH_2Cl_2 + HCl$
Methyl Chloride — Methylene Chloride
$CH_2Cl_2 + Cl_2 \rightarrow CHCl_3 + HCl$
Methylene Chloride — Chloroform
$CHCl_3 + Cl_2 \rightarrow CCl_4 + HCl$
Chloroform — Carbon Tetra Chloride</td><td>2x1=2
Any two examples
2 x 1=2</td><td>4</td></tr>
<tr><td>23.</td><td>A.C.Generator:
 
</td><td>Figure
4
Parts
1</td><td>5</td></tr>
<tr><td>24</td><td>  </td><td>Five Figures
5x1 =5</td><td>5</td></tr>
</table>

KEY SHEET - PART-B

Sl No.	Ans.	Sl No.	Ans.	Sl No.	Ans.
1	D	**11**	A	**21**	15 cm
2	C	**12**	C	**22**	non ohmic
3	B	**13**	D	**23**	Tesla (or) Wb/m^2
4	A	**14**	C	**24**	calcination
5	A	**15**	B	**25**	But, 2-yn, e
6	B	**16**	A	**26**	b
7	C	**17**	A	**27**	e
8	D	**18**	B	**28**	d
9	B	**19**	C	**29**	c
10	D	**20**	D	**30**	a

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