PRAKASAM DISTRICT COMMON EXAMINATION BOARD

HALF YEARLY EXAMINATIONS-JANUARY-2016

GENERAL SCIENCE , Paper – I

(Physical Sciences)

(English Version)

Class-10 - Principles of Evaluation - PART-A

Q.No	Points for Evaluation	Marks allotted	Total Marks
1.	Mass (m_1) = 50 gm Temperature (T_1) = 20°C Mass (m_2) = 50 gm Temperature(T_2) = 40°C Final temperature as per Method of mixtures (T) = $\frac{m_1T_1+m_2T_2}{m_1+m_2}$ = $\frac{50X20+50X40}{50+50}$ = $\frac{1000+2000}{100}$ = $\frac{3000}{100}$ = 30°C	Data Formula Substitute Answer 4x $\frac{1}{2}$	2
2.	The polish applied on the shoes behaves like a mirror. When light rays fall on the polished shoes, they shines more.	2x1	2
3.	<u>Uses of concave mirror :</u> (i) To get different sizes of images (ii) used in solar appliances. (iii) used by ENT doctors (iv) used in wars in olden days to destroy the ships. (v) used to see celestial bodies. <u>Uses of convex mirror :</u> (i) To get diminished images and at less distance. (ii) used as rear view mirrors. (iii) used in ATM centers to see the back view of operator. (iv) used in telescopes.	Any four points related 4x $\frac{1}{2}$	2
4.	At camp fire, heat is transformed to the surroundings by convection. Due to this process, the density of surrounding air changes continuously. The refractive index continuously changes slightly. As a result the objects beyond the fire are seen swaying.	4x $\frac{1}{2}$	2
5.	The reaction between an acid and a base to produce salt and water is called neutralization . Acid + Base → Salt + Water Ex: HCl + NaOH → NaCl + H_2O H_2SO_4 + $Ca(OH)_2$ → $CaSO_4$ + $2H_2O$	1 2x $\frac{1}{2}$	2
6.	Electronic configuration of copper : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ 3d^{10}$ (or) [Ar] $4s^1\ 3d^{10}$ Electronic configuration of chromium : $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ 3d^5$ (or) [Ar] $4s^1\ 3d^5$	2x1	2
7.	Sodium can lose one electron and forms sodium ion (cation) to get octet configuration like Neon. Fluorine can gain one electron and forms Fluoride ion (anion) to get octet configuration like Neon.	2x1	2
8.	The force of attraction among atoms in covalent molecule is weak . Electrostatic forces are present among atoms in ionic molecules. So covalent compounds have low melting points	2x1	2

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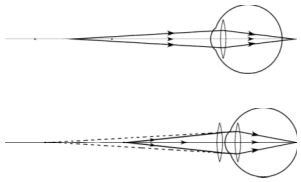
9.	Due to evaporation process	*	1
10.	If the light ray incident along the normal drawn to the interface (or) If the refractive indices of two media are equal	Any related one point 1x1	1
11.	$\frac{1}{f} = (n_{ba}-1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$ (or) $\frac{1}{f} = (n-1)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$	1x1	1
12.	He has to take antacid tablet. (or) take Zintac / gelusil / rantac / histac EVT / ENO / Milk of magnesia ..... (or) drink a cup of dilute baking soda (Sodium bicarbonate) solution.	Any related one point 1x1	1
13.	$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$	1x1	1
14.	$ns^2\ np^6$	*	1
15.	Specific heat of a solid can be measured by using calorimeter. We need calorimeter, water, hot water, thermometer and solid shots (aluminium and copper shots).	1	4
	Procedure:(1) Find the mass of the calorimeter vessel (m_1). (2) Fill half with water , find the mass of calorimeter with water (m_2). (3) Measure the initial temperature ($T_1{}^oC$). This is the temperature of both water and also calorimeter. (4) Place aluminium shots in hot water. The temperature ($T_2{}^oC$). (5) Transfer the aluminium shots into calorimeter quickly (6) Stir the mixture well. (7) Note the final temperature ($T_3{}^oC$). (8) Measure the total final mass (m_3). Heat (Q) = m.s.ΔT	2	
	According to the method of mixtures : Heat lost by the solid =Heat gained by calorimeter + Heat gained by water $(m_3-m_2).S_{alu}.(T_2-T_3) = m_1.S_c.(T_3-T_1) + (m_2-m_1).S_w.(T_3-T_1)$ $S_{alu} = \frac{[m_1 S_c+(m_2-m_1)S_w][T_3-T_1]}{(m_3-m_2)(T_2-T_3)}$ This way we can find the specific heat of a solid. Take S_w = 1 cal/gm -^oC S_c = specific heat of the material of calorimeter vessel Similarly we can find the specific heat of copper.		
16.	(A) Phani can give a Bi convex lens to his grand father.	1	4
	(B) Eye lens can form a clear image on the retina when any object is placed beyond near point. To correct the defect of hypermetropia, we need to use a lens which forms an image of an object beyond near point, when the object is between near point (H) and least distance of distinct vision (L).	2	
		1	

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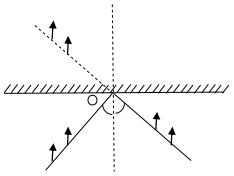
<table>
<tr><td>17.</td><td><u>Verification of first law of reflection:</u> Fix a white paper on a drawing board with the help of clamps. Draw a straight line AB at the centre of the paper and a normal (ON) to AB at ‘O’. Draw a straight line PQ making certain angle ($\hat{i}$) with ON.</td><td>1</td><td rowspan="4">4</td></tr>
<tr><td></td><td>Fix two pins at P and Q on the paper vertically. Observe the images P^I and Q^I of the P and Q, in the mirror kept along the line AB. Fix two more pins R and S such that they are in same line as that of P^I and Q^I.</td><td>1</td></tr>
<tr><td></td><td>Join R, S and O Measure the angle between RS and ON
(angle of reflection).
We find that angle of incidence = angle of reflection.</td><td>1</td></tr>
<tr><td></td><td>  </td><td>1</td></tr>
<tr><td>18.</td><td>Take a prism before a white wall. Keep a light source such that the light rays fall on the prism through a narrow slit which was arranged. Adjust the prism such that the colours (VIBGYOR) fall on the wall. (OR)
Take a metal tray and fill it with water. Place a mirror in water 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 seven colours (VIBGYOR) of rainbow on the screen.
(No need of diagram)</td><td>Any related content
4</td><td>4</td></tr>
<tr><td>19.</td><td>Oxidation : Adding oxygen is called oxidation. (or) Removing oxygen is oxidation (or) Loss of electrons is oxidation.</td><td>1</td><td rowspan="4">4</td></tr>
<tr><td></td><td>Combustion : Burning of a substance in air with oxygen is called combustion.</td><td>1</td></tr>
<tr><td></td><td>Ex: $C + O_2 \rightarrow CO_2$ -----(1) oxidation & combustion
$H_2 + CO_2 \rightarrow H_2O + CO$ -----(2) oxidation but not combustion</td><td>1</td></tr>
<tr><td></td><td>We conclude that all oxidation reactions are not combustion reactions. But all combustion reactions must oxidation reactions.</td><td>1</td></tr>
<tr><td>20.</td><td>four quantum numbers for the differentiating electron of Lithium are
<table>
<tr><td>n</td><td>l</td><td>m_l</td><td>m_s</td></tr>
<tr><td>2</td><td>0</td><td>0</td><td>+½</td></tr>
</table></td><td>1</td><td rowspan="2">4</td></tr>
<tr><td></td><td>(i) Principal quantum number (ii) Azimuthal quantum number
(iii) Magnetic quantum number (iv) Spin quantum number.
<table>
<tr><td></td><td>Symbol</td><td>Scientist</td><td>represents</td><td>Any related matter</td></tr>
<tr><td>PQ</td><td>n</td><td>Bohr</td><td>Shell</td><td>N values of orbits K,L,.. are 1,2,…</td></tr>
<tr><td>AQ</td><td>l</td><td>Sommerfeld</td><td>Sub shell</td><td>l values for s,p,.. sub shells are 0,1,…</td></tr>
<tr><td>MQ</td><td>m_l</td><td>Lande</td><td>Orbital</td><td>values are from $-l$ to $+l$</td></tr>
<tr><td>SQ</td><td>m_s</td><td>Uhlen beck and smith</td><td>Spin of electron</td><td>+½ clock wise
-½ anti clock wise</td></tr>
</table></td><td>2
Any related two points
1
For last column</td></tr>
</table>

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21. (i) Atom 'B' forms negative ion.
(ii) Atom 'A' forms positive ion.
(iii) Valency of atom 'A' is 3.
(iv) If 'A' reacts with 'B' then A_2B_3 molecule is formed.

4 x 1 | 4

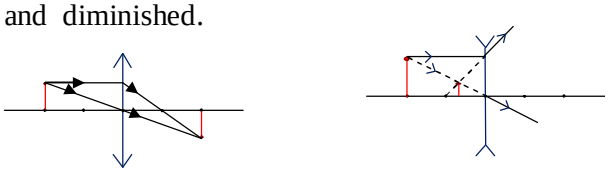
22.

S.No		Period	Group
1	Atomic radius	decrease	increase
2	Ionisation energy	increase	decrease
3	Electron affinity	increase	decrease
4	Electro negativity	increase	decrease

4x½=2
For reasons 2 | 4

23. Case(i): When object is placed at C_2 of a convex lens, the image formed at C_1. The image is real, inverted and same size as object.

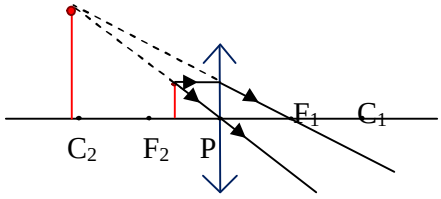
When object is placed at C_2 of a concave lens, the image is formed at the object side between Focus and optic centre. The image is virtual, erect and diminished.



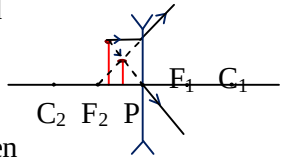
Any one diagram is sufficient & matter 1 + 1½ = 2½

2½ | 5

Case(ii): When object is placed between F_2 of P of a convex lens, the image is formed at the object side. The image is virtual, erect and enlarged.



When object is placed between F_2 of P of a concave lens, the image is formed at the object side between focus and optic centre. The image is virtual, erect and diminished.

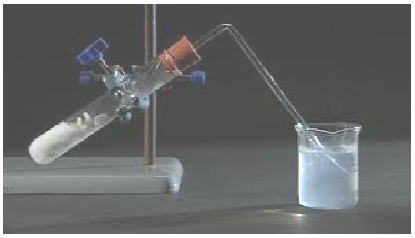


Any one diagram is sufficient & matter 1 + 1½ = 2½

2½

24 The gas liberated is carbon dioxide (CO_2). | 1 | 5

Required apparatus : Test tube, $CaCO_3$, one holed rubber cork, Delivery tube, Spirit lamp, Lime water, Stand, beaker | 2

 | 2

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KEY SHEET - PART-B

S. No	Ans.	S. No	Ans.	S. No	Ans.
1	B	**11**	A	**21**	Oiling/greasing/painting/galvanizing/chrome plating or any related
2	C	**12**	D	**22**	acidic
3	D	**13**	D	**23**	Germanium (Ge)
4	C	**14**	D	**24**	s-s
5	C	**15**	A	**25**	1.54
6	C	**16**	B	**26**	C
7	B	**17**	D	**27**	D
8	C	**18**	D	**28**	A
9	B	**19**	C	**29**	G
10	*	**20**	C	**30**	F

Note : * means allot full marks.

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