

**MEDAK DISTRICT COMMON EXAMINATION BOARD**  
**QUARTERLY EXAMINATIONS-OCTOBER-2015**  
**GENERAL SCIENCE , Paper – I**

(Physical Sciences)  
(English Version)

Time: 2 Hours 45 Min.

Parts A and B

Maximum Marks : 50

**Class-10 - KEY SHEET**

**Section - I**

1. Example for refraction:

- (i) The lemon in water appears in big size.
- (ii) The fish in water seemed to be upper in level.
- (iii) The letters under glass plate appears on the plate.

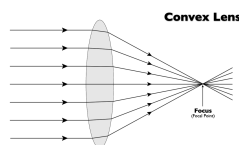
**Note : Any one related point is sufficient.**

2. Some reactions of Oxidation in our daily life :

- (i) Rusting of iron
- (ii) Tarnishing of silver
- (iii) Tarnishing of copper
- (iv) Burning of crackers
- (v) Spoiling of food items
- (vi) .....

**Note : Any one related point is sufficient.**

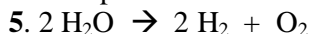
3. Refraction of parallel rays incident on convex lens. (diagram)



4. Exothermic reaction is indicated with symbol 'Q' at products side.

Heating process indicates with  $\Delta$ .

Precipitate is indicated with  $\downarrow$ . And Gases indicated with  $\uparrow$ .



Reactants -  $\text{H}_2\text{O}$

Products -  $\text{H}_2$  and  $\text{O}_2$

6. The light ray passes through it.

7. Examples for sublimation:

- (i) Evaporation of iodine
- (ii) burning of camphor
- (iii) Evaporation of Naphthalene balls
- (iv) Heating of ammonium chloride

**Note : Any two examples related are sufficient.**

**Section - II**

8. **Laws of reflection of light:**

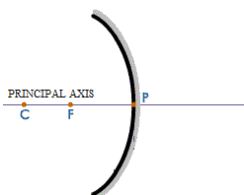
- (i) The angle of incidence is equal to the angle of reflection.
- (ii) The incident ray, reflected ray and normal to the plane of reflection at point of reflection lie in the same plane.

9. **Dew:** The water droplets condensed on cold surfaces is called dew.

**Fog:** The water droplets keep on floating in the air and form thick mist is called fog.

Fog restricts visibility.

10. Concave mirror



11. Plaster of Paris should be stored in moisture-proof container. Because it turns into Gypsum after reacting with moisture present in air. Also it sets into hard solid.
12. Focal length of concave mirror is 15 cm. Radius of curvature is 30 cm.  
Object distance is 30cm.  
Object is placed at C, so image can be collected at C. It means at 30 cm in front of the mirror.

(or)

Distance of the object (u) = -30cm

Focal length (f) = -15cm

Distance of the image (v) = ?

Formula :  $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$

$$\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-15} - \frac{1}{-30} = \frac{-30+15}{450} = \frac{-15}{450} = \frac{-1}{30}$$

$v = -30$  cm ( on the object side)

13. Incident ray - A  
Refracted ray - B  
Rarer medium - D<sub>1</sub>  
Denser medium - D<sub>2</sub>

### Section - III

- 14A. Specific heat of a liquid can be measured by using calorimeter. To perform this experiment we need calorimeter, liquid, hot water, thermometer and metal bob(Iron bob).

**Procedure:**(1) First we have to find the mass of the calorimeter vessel (m<sub>1</sub>).

(2) Fill half of the calorimeter with liquid and find the mass of calorimeter with liquid (m<sub>2</sub>).

(3) Measure the initial temperature with laboratory thermometer (T<sub>1</sub>°C). This is the temperature of both liquid and also calorimeter.

(4) Take a Iron bob and place it in hot water. Heat it nearly 100°C. So measure the temperature of Iron bob (T<sub>2</sub>°C).

(5) Transfer the Iron bob into calorimeter quickly with minimum loss of heat.

(6) Stir the mixture well.

(7) Note the final temperature (T<sub>3</sub>°C).

(8) Measure the final mass of calorimeter vessel along with water and metal bob (m<sub>3</sub>).

$$\text{Heat (Q)} = m.s.\Delta T$$

**According to the method of mixtures :**

Heat lost by the solid = Heat gained by calorimeter + Heat gained by liquid

$$(m_3 - m_2).S_i.(T_2 - T_3) = m_1.S_c.(T_3 - T_1) + (m_2 - m_1).S_L.(T_3 - T_1)$$

By substituting the values measured, we can find the specific heat of the liquid.

Take  $S_i = 0.115$  cal/gm -°C

$$S_c = 0.095$$
 cal/gm -°C

- 14B. Specific heat of a solid can be measured by using calorimeter. To perform this experiment we need calorimeter, water, hot water, thermometer and metal bob.

**Procedure:**(1) First we have to find the mass of the calorimeter vessel (m<sub>1</sub>).

(2) Fill half of the calorimeter with water and find the mass of calorimeter with water (m<sub>2</sub>).

(3) Measure the initial temperature with laboratory thermometer (T<sub>1</sub>°C). This is the temperature of both water and also calorimeter.

(4) Take a metal bob and place it in hot water. Heat it nearly 100°C. So measure the temperature of metal bob (T<sub>2</sub>°C).

(5) Transfer the metal bob into calorimeter quickly with minimum loss of heat.

(6) Stir the mixture well.

(7) Note the final temperature (T<sub>3</sub>°C).

(8) Measure the final mass of calorimeter vessel along with water and metal bob (m<sub>3</sub>).

$$\text{Heat (Q)} = m.s.\Delta T$$

**According to the method of mixtures :**

Heat lost by the solid = Heat gained by calorimeter + Heat gained by water

$$(m_3 - m_2) \cdot S_1 \cdot (T_2 - T_3) = m_1 \cdot S_c \cdot (T_3 - T_1) + (m_2 - m_1) \cdot S_w \cdot (T_3 - T_1)$$

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

This way we can find the specific heat of a solid.

Take  $S_w = 1 \text{ cal/gm } ^\circ\text{C}$

$S_c = 0.095 \text{ cal/gm } ^\circ\text{C}$

**15A. Properties of image formed by a concave mirror.**

Sl. No	Place of object before concave mirror	Place of image	Nature of image Real/ virtual	Erect/ invert	Enlarged/ diminished
1	Between F and C	Beyond C	real	invert	enlarged
2	At C	At C	real	invert	Same size
3	At F	At infinite distance	real	invert	Enlarged
4	Beyond C	Between F and C	real	invert	Small size
5	Between F and P	Behind the mirror	virtual	erect	enlarged

**15B.** (i) In all cases Y has less temperature.

(ii) Heat transfers from X to Y in the cases 2 and 3

(iii) X and Y are in equilibrium conditions when they are attached together in cases 1 and 4.

(iv)  $30^\circ\text{C} = 30 + 273 = 303 \text{ K}$

**16A.** (i) Double displacement reaction

(ii) Decomposition reaction

(iii) Combination reaction

(iv) Displacement reaction

**16A.** (i)  $2 \text{ Mg} + \text{O}_2 \rightarrow 2 \text{ MgO}$

(ii)  $2 \text{ H}_2\text{O} \rightarrow 2 \text{ H}_2 + \text{O}_2$

(iii)  $4 \text{ Fe} + 3 \text{ O}_2 \rightarrow 2 \text{ Fe}_2\text{O}_3$

(iv)  $2 \text{ NH}_3 \rightarrow \text{N}_2 + 3 \text{ H}_2$

**17A.** Acid solution conduct electricity :

Prepare solutions of Hydrochloric acid etc.,

Connect two different coloured electrical wires to graphite rods separately in a 100 ml beaker.

Connect free ends of the wire to 6 volts battery through a bulb & a switch. Make a circuit.

Now pour some dilute HCl in the beaker and switch on the current.

We observe , the bulb glows.

**17B.** Electrolysis of water:

**Required :** plastic beaker, electrodes, connecting wires, 9V battery, water, Salt

**Construction:** Take plastic beaker. Arrange two electrodes through holes at the bottom of the beaker. Connect the electrodes to 9V battery by connecting wires. Pour water in the beaker.

Add a spoon of salt for better conduction of electricity. Keep the test tubes inverted on the electrodes. Switch on the battery.

18. B

22. C

26. C

19. B

23. D

27. C

20. B

24. C

21. A

25.