**INDIA INTERNATIONAL SCHOOL MANGAF**

**SCIENCE -X (HOLIDAY HOMEWORK)**

**PHYSICS**

**LIGHT**

1. Draw the ray diagram in each case to show the position and nature of the image formed when the object is placed:
2. Between the Pole and focus F of a concave mirror
3. At the center of the curvature of a concave mirror
4. In front of a convex mirror
5. At 2F of a convex lens
6. In front of a concave lens
7. The refractive index of diamond is 2.42. What is the meaning of the statement in relation to speed of light?
8. Explain with the help of a diagram, why a pencil partly immersed in water appears to be bent at the water surface.
9. Draw the ray diagram to represent the nature, position and relative size of the image formed by a convex lens for the object placed:
10. At 2F1
11. Between F1 and the optical center O of lens.
12. A ray of light, incident obliquely on a face of a rectangular glass slab placed in air, emerges from the opposite face parallel to the incident ray. State two factors on which the lateral displacement of emergent ray depends.
13. It is desired to obtain an erect image of an object, using a concave mirror of focal length 20 cm.
14. What should be the range of distance of the object from the mirror?
15. Will the image be bigger or smaller than the object?
16. One half of a convex lens of focal length 20 cm is covered with a black paper.
17. Will the lens produce a complete image of the object?
18. Show the formation of image of an object placed at 2F1 of such covered lens with the help of a ray diagram.
19. How will the intensity of the image formed by the half-covered lens compared with non-covered lens?
20. Why does a ray of light bends when it travels from one medium to another medium?
21. The refractive index of water is 1.33 and the speed of light in air is 3 x 108 m/s. calculate the speed of light in water.
22. The refractive index of glass slab is 1.50 and the speed of light is 3 x 108 m/s. calculate the speed of light in glass.
23. For which position of the object does a convex lens form a virtual and erect image? Explain with the help of a ray diagram.
24. What is the nature of the image formed by a concave mirror if the magnification produced by the mirror is +3?
25. State the laws of reflection of light.
26. Define and show the following terms related to the concave mirror:
27. Aperture
28. Radius of curvature.
29. Distinguish between a real and virtual image of an object. What type of an image is formed (a) by a plane mirror (b) on a cinema screen?
30. Define refractive index of a transparent medium. What is its unit? Which has a higher refractive index, glass or water?
31. What is understood by lateral displacement of light? Illustrate it with the help of a diagram. List any two factors on which the lateral displacement of a particular substance depends.
32. Properties of plane mirror, concave mirror and convex mirror.
33. State the type of mirror preferred as rear view mirror in vehicles, shaving mirror. Justify your answer.
34. What is meant by power of lens?
35. State and define the S.I unit of power of a lens.
36. A convex lens of focal length 25 cm and concave lens of focal length 10 cm are placed in close contact with each other. Calculate the lens power of this combination.
37. An object is placed at a distance of 3 cm from a concave lens of focal length 12 cm. Find the position, nature of the image formed.
38. The image of an object placed at 60 cm in front of a lens is obtained on a screen at a distance of 120 cm from it. Find the focal length of the lens. What would be the height of the image if the object is 5 cm high?
39. How far should an object be placed from a convex lens of focal length 20 cm to obtain its image at a distance of 30 cm from the lens? What will be the height of the image if the object is 6 cm tall?
40. A convex lens has a focal length of 10 cm. At what distance from the lens should the object be placed so that it forms a real and inverted image 20 cm away from the lens? What would be the size of the image if the object is 2 cm high? With the help of diagram show the formation of the image by the lens in this case.
41. A concave lens focal length of 20 cm. At what distance from the lens a 5 cm tall object be placed so that it forms an image at 15 cm from the lens? Also calculate the size of the image formed.

***HUMAN EYE AND COLOURFUL WORLD***

1. A 14 year old student is not able to see clearly the questions written on the black board placed at a distance of 5m from him.
2. Name the defect of vision he is suffering from.
3. With the help of labeled diagram show how this defect can be corrected.
4. Name the type of lens used to correct this defect.
5. Why is red color selected for danger signal lights?
6. What is meant by spectrum of white light? How can we recombine the components of white light after a prism has separated them? Draw a diagram to illustrate it.
7. Explain why do the planets not twinkle but the stars twinkle.
8. What is dispersion of white light? What is the cause of such dispersion? Draw a diagram to show the dispersion of white light by a glass prism.
9. Explain the following terms used in relation to defects in vision and correction provided by them:
10. Myopia
11. Astigmatism
12. Fat sightedness
13. Bifocal lenses
14. Name the part of the eye that helps us to focus near and distant objects in quick succession.
15. What type of defect if a person is using:
16. Concave lens
17. Convex lens
18. The sky appears dark instead of blue to astronaut. State its reason.
19. Explain the following with help of diagram:
20. Myopia
21. Far sightedness
22. State the color which bends most and which bends least while passing through a glass prism.
23. What is Tyndal effect? Give an example of a phenomenon where tyndal effect can be observed.
24. A star appears slightly higher than its actual position in the sky. Illustrate with the help of a labeled diagram.
25. Define power of accommodation of an eye?
26. A person with a myopic eye cannot see objects beyond 1.2 m directly. What should be the type of corrective lens used? What would be its power?
27. State at least one function each of the following:
28. Iris
29. Pupil
30. Ciliary muscles
31. Crystalline lens
32. Retina
33. Cornea
34. Why does sun appear reddish at sunrise?
35. A star appears brighter some time and fainter some time. Give reason.
36. Why does sky appears blue during day time. Give reason.
37. Explain the formation of rainbow and name the type of particles which act as a prism in the formation of rainbow in the sky.

**CHEMISTRY**

1. Write balanced chemical equations for the reaction of dil. HCl with
2. Zn metal
3. Na2 CO3
4. NaOH
5. Write the balanced chemical equations for the following reactions:
6. Calcium Hydroxide + Carbon dioxide Calcium carbonate + Water
7. Aluminum + Copper chloride Aluminum chloride + Copper
8. Calcium carbonate + Hydrochloric acid Calcium chloride + Water + Carbon dioxide
9. Mention the colour of FeSO4 .7H2O crystals. How does this colour change upon heating? Give balanced chemical equation for the change.
10. What does one mean by exothermic and endothermic reactions? Give examples.
11. Surface of some metals lose their brightness when kept in air for a long time. Why?
12. Explain two ways by which food industries prevent rancidity.
13. What is rusting of iron? Give four ways to prevent rusting of iron.
14. Can oxidation or reduction take place alone? Why or why not? What are such reactions called?
15. What are non - redox reactions? Explain with the help of examples.
16. A student has mixed the solutions of lead (II) nitrate and potassium iodide.
17. State the colour of the precipitate formed.
18. Write a balanced chemical equation for the reaction
19. Suggest an alternative name for the above precipitation reaction. Give justification for your answer.
20. You might have noted that when copper powder is heated in a china dish, the surface of copper powder becomes coated with a black colour substance.
21. How has this black coloured substance formed?
22. What is that black substance?
23. Write the chemical equation of the reaction that takes place.
24. What is a thermo chemical equation? Give two examples.
25. What are olfactory indicators? Give an example.
26. What is a neutralization reaction? Give some examples.
27. You might have seen lemon or tamarind juice being used to clean tarnished surface of copper vessels. Explain why these sour substances are effective in cleaning the vessels?
28. Tap water conducts electricity whereas distilled water does not. Why?
29. Compounds like alcohol and glucose which also contain hydrogen are not categorized as acids. Why? Describe an activity to justify your answer, draw the necessary diagram and label it.
30. How will you prepare dilute acid solution?
31. What is a universal indicator? State the purpose for which this indicator is used.
32. What are acids and bases according to Arrhenius theory?

BIOLOGY

1. Name the artificial method for the removal of liquid nitrogenous waste from body.

2. Name any three waste products of plants?

3. Name three excretory organs of man.

4. Name the part of plants which helps in transportation.

5. Name the juice secreted by the liver.

6. What is the function of digestive enzymes?

7. What is the role of saliva in the digestion of food?

8. Point out two differences between an artery and a vein.

9. What do you mean by double circulation of blood?

10. Write any two points of difference between respiration in plants and animals?

11. What criteria do we use to decide whether something is alive?

12. What are the differences between autotrophic nutrition and heterotrophic nutrition?

13. Where do plants get each of the raw materials required for photosynthesis?

15. (i) Draw a labelled diagram of the human respiratory system.