



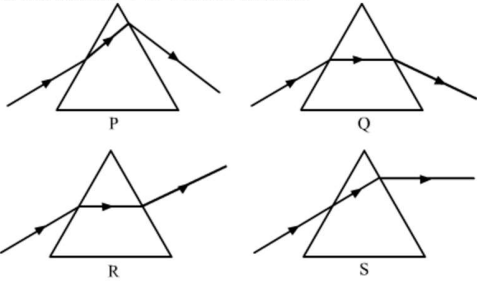
Test / Exam Name: Physics – Light Reflection And Refraction Standard: 10th Subject: Science
Student Name: _____ Section: _____ Roll No.: _____
Questions: 26 Time: 01:30 hh:mm Marks: 40

Instructions

1. New section on new page
2. Rough work at the last page should be in proper manner too
3. Make sure to write in the point formation. You handwriting should be neat and clean
4. Honesty is the best policy.

SECTION-A

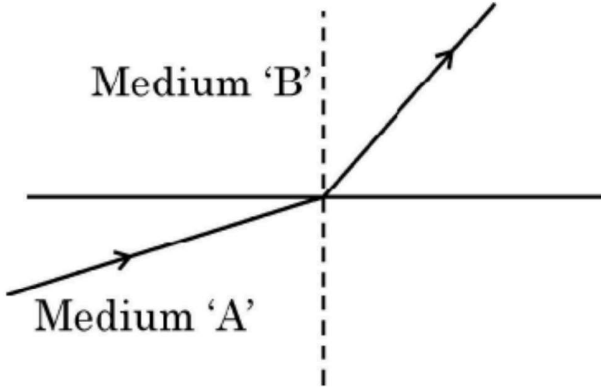
Q1. Study the following diagrams in which the path of a ray of light passing through a glass prism as traced by four students P, Q, R and S is shown: **1 Mark**



The student who has traced the path correctly is:

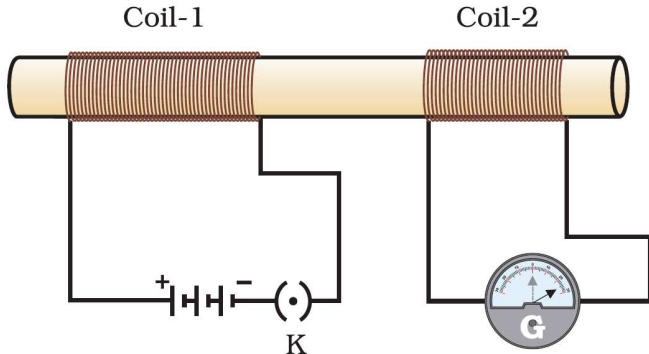
- A P B Q C R D S
- Q2. A student obtained a sharp image of a candle flame placed at the distant end of the laboratory table on a screen using a concave mirror to determine its focal length. The teacher suggested him to focus a distant building about 1 km far from the laboratory, for getting more correct value of the focal length. In order to focus the distant building on the same screen the student should slightly move the: **1 Mark**
- A Mirror away from the screen. B Screen away from the mirror.
C Screen towards the mirror. D Screen towards the building.
- Q3. A student has obtained the image of a distant object with a concave mirror to determine its focal length. If he has selected a well illuminated red building as object, which of the following correctly describes the features of the image formed? **1 Mark**
- A Virtual, inverted, diminished image in red shade. B Real, erect, diminished image in pink shade.
C Real, inverted, diminished image in red shade. D Virtual, erect, enlarged image in red shade.
- Q4. A student traces the path of a ray of light through a rectangular glass slab for the different values of angle of incidence. He observes all possible precautions at each step of the experiment. At the end of the experiment, on analysing the measurements, which of the following conclusions is he likely to draw? **1 Mark**
- A $\angle i < \angle e$ B $\angle i < \angle r$
C $\angle i > \angle e$ D $\angle i = \angle e$
- Q5. An object is placed in front of a convex mirror at infinity. According to the New Cartesian Sign Convention, the sign of the focal length and the sign of the image distance in this case are respectively: **1 Mark**
- A +, - B -, + C -, - D +, +
- Q6. To determine focal length of a concave mirror a student obtains the image of a well lit distant object on a screen. To determine the focal length of the given concave mirror he needs to measure the distance between: **1 Mark**
- A Mirror and the object. B Mirror and the screen.
C Screen and the object. D Screen and the object and also mirror and the screen.
- Q7. A student very cautiously traces the path of a ray through a glass slab for different values of the angle of incidence $\angle i$ and the angle of emergence $\angle e$ for every value of the angle of incidence. On analysing these measurements of angles, his conclusion would be. **1 Mark**

- Q20. What is atmospheric refraction? List two phenomena which can be explained on the basis of atmospheric refraction. **2 Marks**
- Q21. The absolute refractive indices of glass and water are $4/3$ and $3/2$ respectively. If the speed of light in glass is 2×10^8 m/s, calculate the speed of light in (i) vacuum, (ii) water. **2 Marks**
- Q22. A light ray enters from medium A to medium B as show in figure. **2 Marks**



1. Which one of the two media is denser w.r.t. other medium? Justify your answer.
2. If the speed of light in medium A is v_a and in medium B is v_b , what is the refractive index of B with respect to A.

- Q23. For which position of the object does a convex lens form a virtual and erect image? Explain with the help of a ray diagram. **3 Marks**
- Q24. Two coils of insulated copper wire are wound over a non-conducting cylinder as shown. Coil 1 has comparative large number of turns. State your observations, when **3 Marks**



1. Key K is closed.
 2. Key K is opened.
- Give reason for each of your observations.

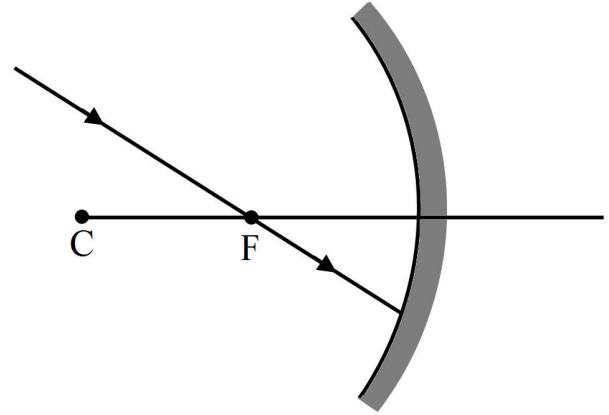
- Q25. Give reasons for the following: **3 Marks**
1. Danger signals installed at airports and at the top of tall buildings are of red colour.
 2. The sky appears dark to the passengers flying at very high altitudes.
 3. The path of a beam of light passing through a colloidal solution is visible.
- Q26. A narrow beam PQ of white light is passing through a glass prism ABC as shown in the diagram. **3 Marks**

- A $\angle i > \angle e$ B $\angle i = \angle e$
C $\angle i < \angle e$ D $\angle i = \angle r$
- Q8. A student was asked by his teacher to find the image distance for various object distances in case of a given convex lens. He performed the experiment with all precautions and noted down his observations in the following table: **1 Mark**

| S. No. | Object distance (cm) | Image distance (cm) |
|--------|----------------------|---------------------|
| 1 | 60 | 15 |
| 2 | 48 | 16 |
| 3 | 36 | 21 |
| 4 | 24 | 24 |
| 5 | 18 | 36 |
| 6 | 16 | 48 |

After checking the observation table the teacher pointed out that there is mistake in recording the image distance in one of the observation. Find the serial number of the observation having faulty image distance:

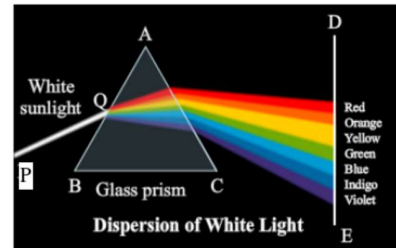
- A 2 B 3 C 5 D 6
- Q9. For Questions number 17 to 20, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below. **1 Mark**
- Assertion (A):** A person suffering from myopia cannot see the distant objects clearly.
Reason (R): A converging lens is used for the correction of myopic eye as it can form real as well as virtual images of the objects placed in front of it.
- A Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
B Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
C Assertion (A) is true, but Reason (R) is false.
D Assertion (A) is false, but Reason (R) is true.
- Q10. Why does sky look blue on a clear day? **1 Mark**
- Q11. Copy this figure in your answer-book and show the direction of the light ray after reflection: **1 Mark**



- Q12. What is the magnification of the images formed by plane mirrors and why? **1 Mark**
- Q13. Give an example of a phenomenon where Tyndall effect can be observed. **1 Mark**
- Q14. Convex mirrors have _____ in comparison to concave mirrors. **1 Mark**
- Q15. Convex mirror and convex lens always form virtual image. [True/ False] **1 Mark**
- Q16. A ray of light is incident on a plane mirror at an angle of 30° . What is the angle of reflection? **1 Mark**

SECTION-B

- Q17. What is the minimum number of rays required for locating the image formed by a concave mirror for an object. Draw a ray diagram to show the formation of a virtual image by a concave mirror. **2 Marks**
- Q18. If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it? Draw a labelled ray diagram to support your answer. **2 Marks**
- Q19. Explain why the planets do not twinkle but the stars twinkle. **2 Marks**



Trace it on your answer sheet and show the path of the emergent beam as observed on the screen DE.

1. Write the name and cause of the phenomenon observed.
2. Where else in nature is this phenomenon observed?
3. Based on this observation, state the conclusion which can be drawn about the constituents of white light.