

India's Number 1 Education App

PHYSICS

BOOKS - U-LIKE PHYSICS (HINGLISH)

THE HUMAN EYE AND THE COLOURFUL WORLD

N C E R T Exercises

1. Why do stars twinkle ?

2. Explain why the planets do not twinkle.

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3. Why does the Sun appear reddish early in the morning?

4. Why does the sky appear dark instead of

blue to an astronaut ?

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Multiple Choice Questions

1. Stars twinkle due to

A. atmospheric refraction.

B. atmospheric reflection.

C. attering of light.

D. dispersion of light.

Answer: A



2. Which of the following diagrams represents

refraction of light through a prism correctly?



A. Diagram (i)

- B. Diagram (ii)
- C. Diagram (iii)
- D. Diagram (iv)

Answer: D

- 3. When a beam of white light passes through
- a glass prism, it splits up into seven colours.
- This phenomenon is due to

A. refraction of light.

B. dispersion of light

C. diffraction of light.

D. absorption of light.

Answer: B

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4. When white light passes through a glass

prism

A. red coloured ray undergoes maximum

deviation.

B. green coloured ray undergoes minimum

deviation.

C. blue coloured ray undergoes minimum

deviation.

D. violet coloured ray undergoes maximum

deviation.

Answer: D

5. Which of the following phenomena of light are involved in the formation of a rainbow ?

A. Reflection, refraction and dispersion.

B. Refraction, dispersion and scattering.

C. Refraction, dispersion and internal

reflection.

D. Dispersion, scattering and refraction.







6. On account of atmospheric refraction

- A. sun appears 4 minutes before actual sunrise.
- B. sun disappears 4 minutes before actual sunset.
- C. sun is visible 2 minutes before actual sunrise.

D. sun becomes visible 2 minutes after

actual sunrise.

Answer: C



7. At noon the sun appears white as

A. light is least scattered.

B. all the colours of the white light are

scattered away.

C. blue colour is scattered the most.

D. red colour is scattered the most.

Answer: A



8. The sky appears reddish at the sunset due

to the fact, that

A. blue-violet light has been scattered

least.

B. red light is scattered most.

C. blue light has been mostly scattered but

red light has scattered the least.

D. for red light the angle of refraction is

less than for blue light.

Answer: C

9. Choose the correct depiction for dispersion

of white light on passing through a prism.



A. Fig (a)

B. Fig (b)

C. Fig (c)

D. Fig (d)

Answer: A



10. If the earth had no atmosphere, the sky would have looked.

A. brown

B. black

C. white

D. blue

Answer: B

11. The clear sky appears blue because

A. blue light gets easily absorbed in the atmosphere.

- B. blue-violet light gets scattered less than other colours
- C. ue-violet light gets scattered more than
 - light of all other colours by the atmosphere.
- D. ultraviolet radiations are absorbed in the atmosphere.





12. An astronaut lands his spacecraft on the surface of moon and observes the sky. He will find the colour of sky as

A. deep blue

B. light blue

C. white

D. dark

Answer: D



13. Which of the following phenomena contributes significantly to the reddish appearance of the Sun at sunrise or sunset ?

A. Dispersion of light.

B. Scattering of light.

C. Reflection of light.

D. Refraction of light.

Answer: B



14. Danger signals installed at airports and at the top of tall buildings all of red colour. These signals are visible from a distance. It is because

A. red coloured light is scattered the most

from atmosphere particles.

B. red coloured light is scattered the least from atmosphere particles. C. red coloured light is absorbed most by smoke or fog present in atmosphere D. red coloured light suffers minimum deviation in hot air of atmosphere.

Answer: B

15. The sky appears dark to passengers flying at very high altitudes mainly because:

A. scattering of light is not enough at such heights.

B. there is no atmosphere at great heights.

C. he size of molecules is smaller than the

wavelength of visible light.

D. the light gets scattered towards the earth.





16. Twinkling of stars is due to atmospheric

A. dispersion of light by water droplets.

B. scattering of light by dust particles.

C. refraction of light by different layers of

varying refractive indices.

D. internal reflection of light by clouds





True Or False

 Deviation caused by a prism is maximum for violet coloured ray because wavelength of violet light is maximum.

2. The sky appears to be silvery white when viewed from a space craft situated at a height of 1000 km above the earth.

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3. White light is a combination of light of seven colours and these colours are separated from one another when white light is passed through a prism.

4. Apparent elevation of a star appears to be less than its true elevation on account of atmospherie refraction



5. Stars as well as planets appear twinkling on

a clear night.

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Fill In The Blanks

1. ______ is the phenomenon of splitting of white light into its constituent colours while passing through a triangular prism.



2. In a commonly observed rainbow the innermost are is of _____ colour and the outermost arc is of _____ colour.

3. ______ is the phenomenon due to which light gets deflected and diffused all over as a result of its interplay with tiny matter particles.

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4. Sky appears light blue on account of the

phenomenon of_____.

5. Apparent duration of a day is _____
than the actual duration of the day .
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Assertion Reason Questions

 Assertion (A): When white light passes through a tiangular prism, the emergent light consists of light of seven colours.
 Reason (R):Name of seven colours can be remembered by the acronym VIBGYOR. A. Both (A) and (R) are true and (R) is

correct explanation of the assertion.

B. Both (A) and (R) are true but (R) is not

the correct explaration of the assertion.

C. (4) is true but (R) is false.

D. (A) is false but (R) is true.

Answer: B

2. Assertion (A): The stars twinkle in night but

the planets do not twinkle.

Reason (R) :The stars are much bigger in size than the planets.

A. Both (A) and (R) are true and (R) is

correct explanation of the assertion.

B. Both (A) and (R) are true but (R) is not

the correct explaration of the assertion.

C. (4) is true but (R) is false.

D. (A) is false but (R) is true.

Answer: B



Assertion (A): Sky predominantly appears
 light blue on account of scattering of light.
 Reason (R): Wavelength of blue light is least.

A. Both (A) and (R) are true and (R) is

correct explanation of the assertion.

B. Both (A) and (R) are true but (R) is not

the correct explaration of the assertion.

C. (4) is true but (R) is false.

D. (A) is false but (R) is true.

Answer: C



Very Short Answer Questions

1. On which principle does a prism form the

image of an object?

2. In which direction a ray of light bends while

emerging out of a prism?

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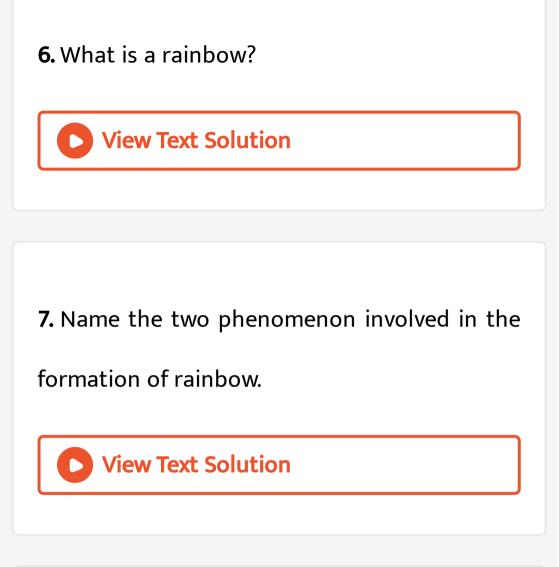
3. What is dispersion of light ?



4. Why do we get colours when white light passes through a prism ?
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5. Name the component of white light that deviates (I) the least and (Ii) the most while passing through a glass prism.





8. On what factor does the colour of the light

depends ?



9. What phenomenon is depicted in the given diagram [Fig. 11.4] ? Explain the phenomenon and label A and B in the diagram.

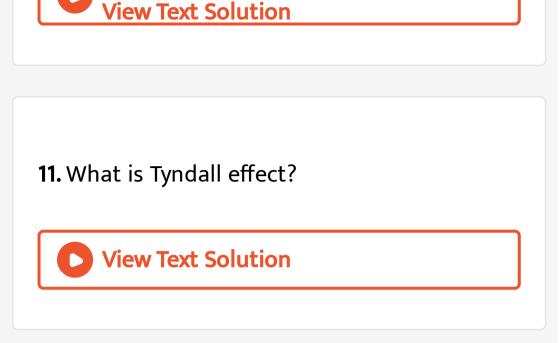




10. Name the phenomena due to which we get

1ight from the Sun before actual sun rise.





12. Give an example of a phenomenon where

Tyndall effect can be observed.



13. List the factors on which scattering of light

depends.

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14. What will be the colour of the sky when it is observed from a place in the absence of any atmosphere?

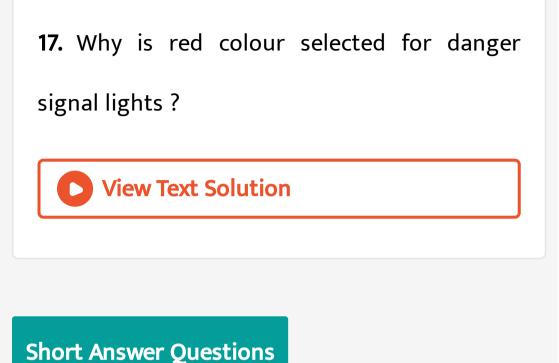
15. What is the colour of scattered sunlight when the size of the scattering particle is relatively large ?



16. The sky appears dark to the passengers

flying at very high altitudes. Why?





1. What is a prism ? Draw a neat diagram to show refraction of a light ray through a triangular glass prism. Define angle of deviation.





2. What is meant by the dispersion of white light ? Draw a neat diagram to show dispersion of white light by a glass prism. What is the cause of dispersion ?



3. Explain why the planets do not twinkle but

the stars twinkle.

4. What is a rainbow ? Draw a labelled diagram

to show the formation of rainbow.

OR

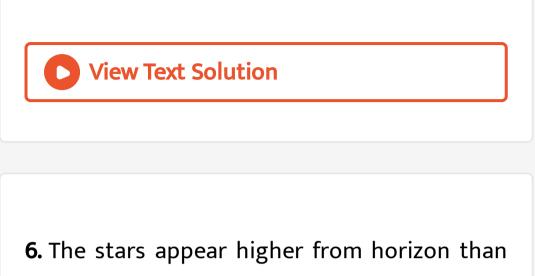
Describe the formation of rainbow in the sky

with the help of a diagram.

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5. What is atmospheric refraction ? Briefly explain. Why does apparent position of a star

appear different from its true position ?



they actually are. Explain why it is so.

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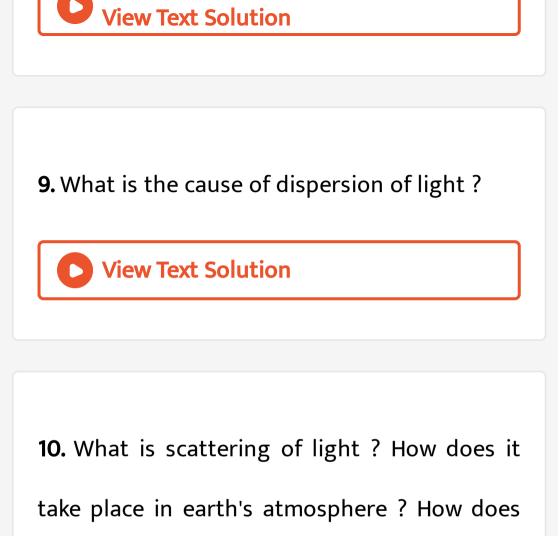
7. Explain with the help of a diagram, how we are able to observe the sunrise about two minutes before the sun gets above the

horizon. Hence, explain why does apparent duration of a day from sunrise to sunset is 4 minutes more than its actual duration.

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8. Describe an activity to show that the colours of white light splitted by a glass prism can be recombined to get white light by another identical glass prism. Also draw ray diagram to show the recombination of the spectrum of white light.





colour of scattered light depend on the size of

scattering particles ?

11. What is scattering of light ? Use this phenomenon to explain why (i) the sun appears reddish at sunrise, and (ii) the clear sky appears blue.

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12. Why does the Sun appear reddish early in the moming? Will this phenomenon be observed by an observer on the Moon ? Justify your answer with a reason.



13. Fig. 11.11 shows an experimental set up for observing a phenomenon of light in colloidal solutions. A student dissolves about 200 g of sodium thiosulphate (hypo) in about 2 L of clean water in the tank and adds about 1 to 2 mL of concentrated HSO4 to the water. What would he observe after the source of light S is switched on

(i) from the three sides of the glass tank?

(ii) from the fourth side of the glass tank

facing the circular hole ? Give reason.



14. Briefly describe an experimental arrangement for observing scattering of light in colloidal solution.



15. Briefly explain the observed blue colour of clear sky. What would have happen if there is no atmosphere on the earth?



Long Answer Questions

1. In the Fig. 11.12, mark the angle of prism, angle of deviation for red and violet colours

and incident ray.





2. Explain how the components of white light can be recombined after a prism has separated them. Explain with the help of figure.





3. What is atmospheric refraction ? Use this phenomenon to explain the following natural events: (a) Twinkling of stars, (b) Advanced sunrise and delayed sunset. Draw diagrams to illustrate your answer.

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4. Explain atmospheric refraction.

5. Traffic signals on cross roads are of red colour. Give reason for choosing only this colour.

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6. Explain why do stars twinkle but planets do

not twinkle.

7. Explain with the help of a diagram, why a pencil partly immersed in water appears to be bent at the water surface.



8. At noon, the Sun appears as white but in

morning or evening appears as reddish. Why?

