Ray Model of Light

UNIT 5

Section A Multiple Choice Questions

For each question, choose the most suitable option and write its letter (A, B, C or D) in the brackets provided.

1. Which of the following objects is **not** luminous?

   A Moon B Sun
   C Stars D Fireflies [ ]

2. Rays of light **cannot** be _____.

   A parallel B converging
   C diverging D perpendicular [ ]

3. Which of the following is/are true about both light and sound?

   I Both light and sound are forms of energy.
   II They can be converted into other forms of energy.
   III They undergo reflection and refraction.

   A I only B I and II only
   C I and III only D I, II and III [ ]

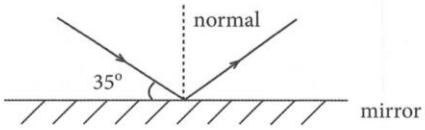
4. Which of the following statements about light is **not** true?

   A Light travels in a straight line.
   B Speed of light in a vacuum is 3×10^8 m/s.
   C Light rays do not need any medium to travel.
   D Speed of light remains constant in all mediums. [ ]

5. When light is reflected by a plane mirror, the angle of reflection is _____.

   A less than the angle of incidence
   B greater than the angle of incidence
   C equal to the angle of incidence
   D equal to the angle of refraction [ ]

6. The diagram shows a ray of light reflected in a plane mirror. The angle of reflection is _____.



A 35°
B 40°
C 50°
D 55° [ ]

7. Which of the following statements is **not** true about the image formed in a plane mirror?

A The image is laterally inverted.
B The image is real.
C The image is virtual.
D The image is the same size as the object. [ ]

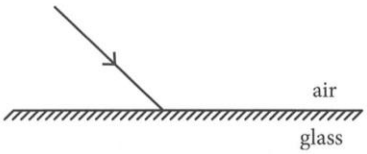
8. If a person stands 2 m in front of a plane mirror, what is the distance between him and his image produced by the mirror?

A 1 m B 2 m
C 4 m D 8 m [ ]

9. Which of the following does **not** involve the use of a mirror?

A A car driver looking out for vehicles coming from behind
B Periscope in submarines
C Magnifying glass
D X-ray machine [ ]

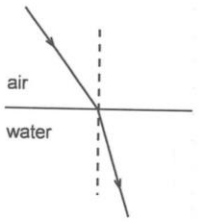
10. When light rays travel from air to glass, _____.



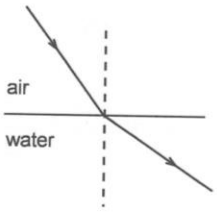
A the angle of incidence is equal to the angle of refraction
B the angle of incidence is less than the angle of refraction
C the angle of incidence is greater than the angle of refraction
D the angle of refraction is greater than 90° [ ]

11. Which of the following diagrams shows the correct path of light?

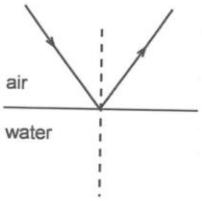
A



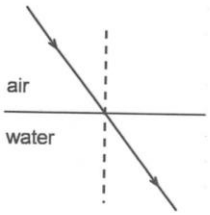
B



C



D



[ ]

12. How many colours are there in a light spectrum?

A 3
B 7
C 9
D 12

[ ]

13. White light can be obtained by mixing _____ coloured lights.

A red, blue and yellow
B red, blue and green
C blue, green and yellow
D green, yellow and magenta

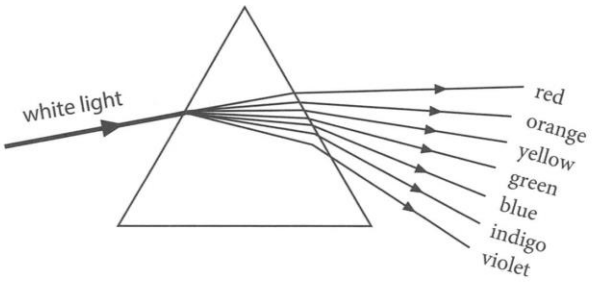
[ ]

14. A spectrum of coloured light is produced after dispersal of light due to refraction. Which coloured light bends the most in this process?

A Red
B Orange
C Blue
D Violet

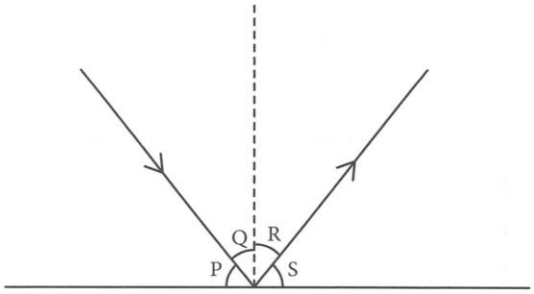
[ ]

15. The splitting of white light into different colours is called _____.



A reflection **B** transformation
C spectrum **D** dispersion [ ]

Answer questions **16** and **17** using the diagram given below.



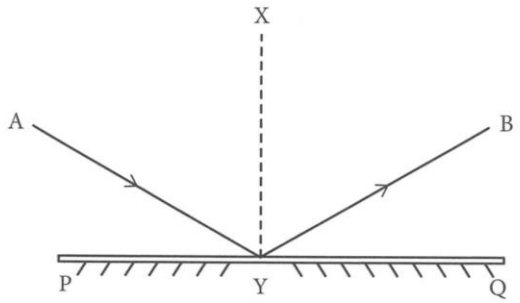
16. Which two angles are equal?

A P and Q
B Q and R
C P and R
D Q and S [ ]

17. Which letter represents the angle of incidence?

A P
B Q
C R
D S [ ]

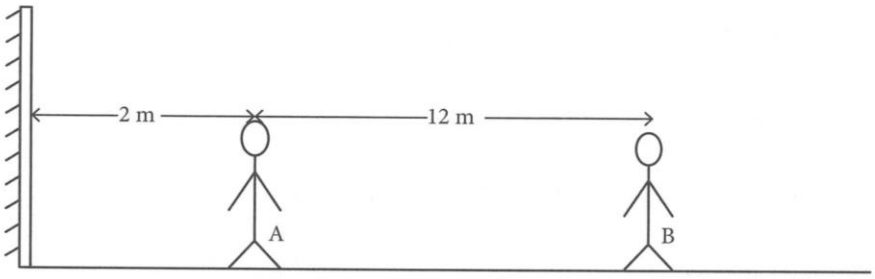
18. From the diagram below, given that PQ is a plane mirror, which is the reflected ray and the angle of reflection?



	Reflected ray	*Angle of reflection*
A	AY	AYP
B	AY	AYX
C	YB	XYB
D	YB	BYQ

[ ]

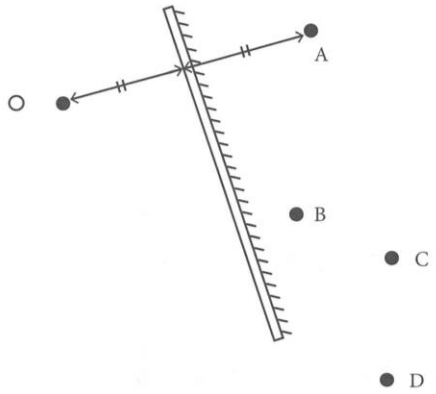
19. Two men are standing in front of a plane mirror as shown. When man A looks into the mirror, how far does man B seem to be away from him?



A 12 m
B 16 m
C 26 m
D 28 m

[ ]

20. An object O is placed in front of a mirror. Which is a possible position of the image?



[ ]

Section B Short Answer Questions

Answer all the questions in the spaces provided.

1. Fill in the blanks with suitable words.

(a) Light travels in a _____ line.

(b) We see things because light is _____ by them.

(c) Regular reflection occurs when light is reflected off a _____ surface.

(d) An image formed by a mirror is _____ inverted.

2. Explain why a swimming pool looks more shallow than it really is.

_____

_____

_____

3. Write 'True' or 'False' beside each of the following sentences.

(a) The size of the image formed by a plane mirror is smaller than the object. _____

(b) Convex mirrors give upright images with a wider scope of view. _____

(c) Concave mirrors give virtual images that are magnified if the object is near the mirror. _____

(d) Convex mirrors are used by dentists. _____

4. For each of the properties below, give an example of an object that has that property.

(a) Translucent _____

(b) Transparent _____

(c) Opaque _____

(d) Luminous _____

5. The moon is a non-luminous object. Explain.

_____

_____

_____

_____

6. The diagram shows a ray AB falling on a mirror. Complete the diagram and label

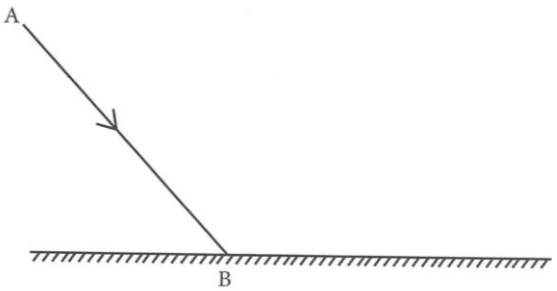
(a) the normal;

(b) the incident ray;

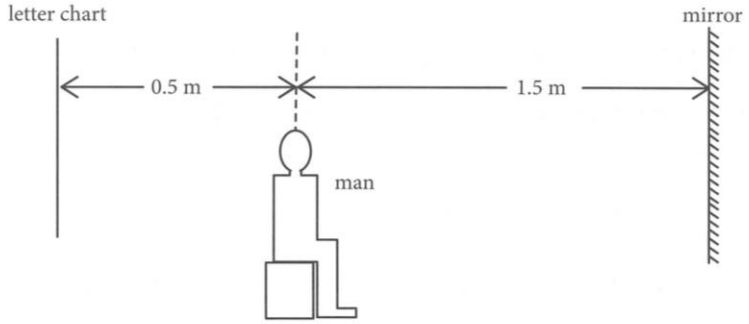
(c) the reflected ray;

(d) the angle of incidence;

(e) the angle of reflection.



7. A man sits in an optician's room. He is facing the mirror and his eyes are 1.5 m in front of it, while the letter chart is 0.5 m behind his eyes.



(i) How far is the image of the letter chart from the man's eye?

_____

(ii) State **three** characteristics of the image formed.

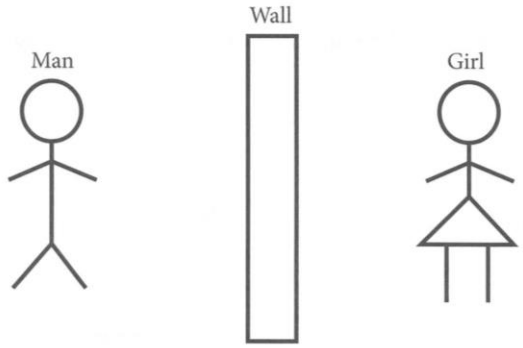
_____

_____

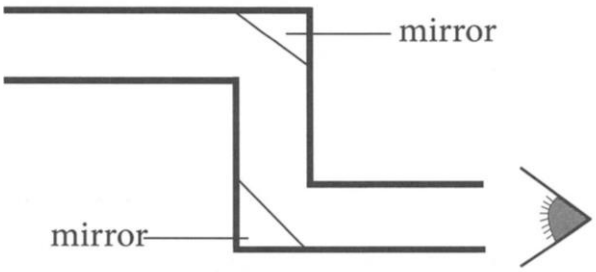
8. A man is sitting on the other side of a wall but is able to see a girl on the other side due to a mirror.

(a) Show in the diagram where this mirror could be.

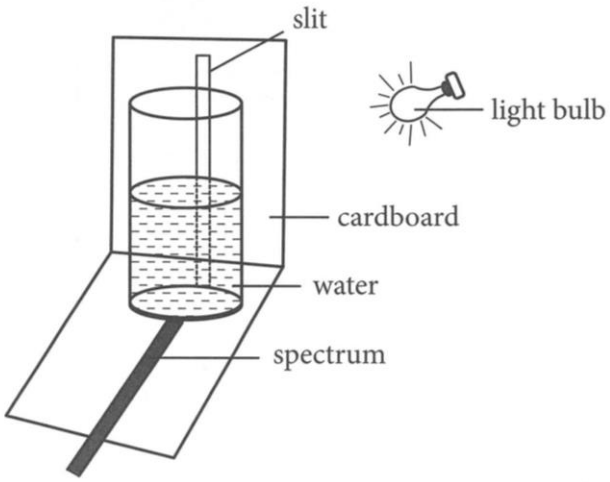
(b) Draw light rays to show this.



9. A periscope of a submarine is used to see objects above water. Draw light rays to show how this occurs.



10. When a strong beam of light from the light bulb passes through the slit and glass of water, a spectrum is formed as shown.



(a) What property of white light does the experiment show?

_____

(b) What colours can you find in the spectrum?

_____

(c) Which colour of light has the fastest speed when it passes through the glass of water?

_____

(d) The rainbow is caused by the dispersion of sunlight by _____.

11. A fisherman throws a spear at a fish in a pond.

(a) Why does the fisherman keep missing the fish?

_____

_____

(b) Draw the actual location of the fish in the diagram below.

12.

(a) In the diagram above, draw the position of the moon during a lunar eclipse.

(b) Draw **four** rays of light from the Sun to illustrate the lunar eclipse.

(c) What happens during a lunar eclipse?

_____

_____

13. The pictures below show two different types of mirrors.

Mirror A

Mirror B

(a) Name the two mirrors shown above.

Mirror A: _____

Mirror B: _____

(b) Describe the images formed by the two mirrors.

Mirror A: _____

Mirror B: _____

(c) For each type of mirror, name **two** places where they are used and explain how they are useful.

_____

_____

_____

_____

Section C Free Response Questions

Answer all the questions in the spaces provided.

1. (a) What are the **two** types of reflection?

(b) Explain, with the help of diagrams, the two types of reflection in (a).

(c) Give **one** example for each type of reflection in (a).

2. (a) What is refraction?

(b) Give **two** examples of refraction.

3. (a) What are the **two** types of curved mirrors?

(b) Give **two** examples for the use of each type of mirror.

(c) List **four** characteristics of the image formed by a plane mirror.

4. (a) What is dispersion?

(b) What is a spectrum?

(c) Suggest **two** ways of recombining the colours of the spectrum.