

GREENLAWNS SCHOOL, WORLI
Final Examination 2018
PHYSICS

STD: VIII

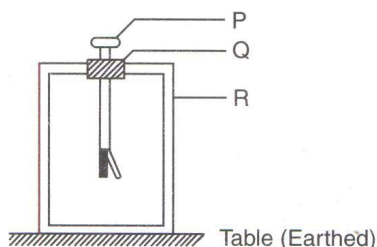
Date: 23/02/2018

Marks: 80

Time: 2hrs

Question 1

- a. State laws of refraction of light. [2]
- b. Define the terms:
(i) Amplitude
(ii) Frequency (as applied to sound waves) [2]
- c. A given liquid changes into the gaseous state at a fixed temperature as well as at all temperatures. [2]
(i) Name the process that takes place in each of the above two cases.
(ii) Mention two points of difference between the two cases in (i) above.
- d. In each case, state which body loses electron:
i. A glass rod is rubbed with silk.
ii. An ebonite rod is rubbed with fur. [2]
- e. In the figure given below label the parts P, Q and R and name the instrument. [2]



Question 2

- a. Draw a diagram to show that white light can be split up into different colours. [2]
- b. What change, if any, would you expect in the characteristics of a musical sound when we increase: (i) its frequency, (ii) its amplitude? [2]
- c. You have just paid the electricity bill for your house,
(i) What was it that your family consumed for which you had to pay?
(ii) In what unit was it measured? [2]
- d. What do you mean by conservation of charges? [2]
- e. What is electroscopes? Name two types of electroscopes. [2]

Question 3

- a. Two friends were playing on identical guitars whose strings were adjusted to give notes of the same pitch. Will the quality of the two notes be the same? Give a reason for your answer. [2]
- b. What is the effect of increase in pressure on the melting point of ice and boiling point of water? [2]
- c. What is earthing? What is its use? [2]
- d. How is M.C.B is superior to the fuse wire? [2]
- e. State two precautions to be taken while using electricity. [2]

Question 4

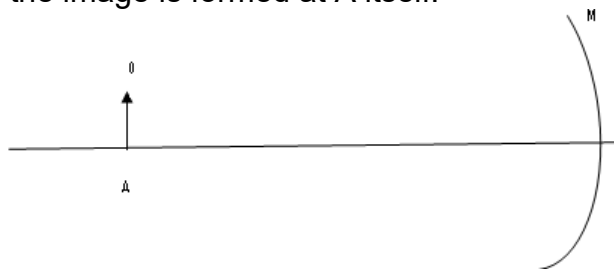
- a. Why does evaporation always produce cooling? [2]
- b. Does the boiling point of water change with altitude? If so, how? [2]
- c. Name the material used for making a fuse wire. State two properties of the material of fuse wire which make it suitable for use. [2]
- d. Score off the incorrect words and write correctly the following:
In wiring a three pin plug, the brown sleeved wire is connected to the neutral/live pin and green/blue wire is connected to metal body of the appliance. [2]
- e. How are the electrical appliances connected in a house circuit; in series or parallel? Give reason [2]

Question 5

- a. (i) What is meant by refraction?
(ii) Express the refractive index n of a medium:
(1) In terms of the velocity of light;
(2) In terms of the angle of incidence i in air and the angle of refraction r in a denser medium. [3]
- b. A driver uses a convex mirror as rear view mirror. Explain the reason with the help of diagram. [3]
- c. i. Draw a ray diagram to represent the formation of a magnified and virtual image in a spherical mirror.
ii. Name the mirror which always gives a virtual and diminished image.
iii. How will you differentiate the mirrors in question i and ii without touching. [4]

Question 6

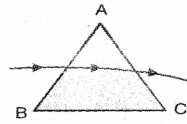
- a. Draw a ray diagram to illustrate how a ray of light incident obliquely on one face of a rectangular glass slab of uniform thickness emerges parallel to its original direction. Mention which pairs of angles are equal. [2]
- b. How lightning is produced? What are its effects? [3]
- c. In the diagram given below, M is the concave mirror and A is a point on its principal axis. If an object is kept at A, the image is formed at A itself.



- i. Draw ray diagram to show the image in diagram.
ii. What is the distance PA is called.
iii. If B is the midpoint of PA, then what is the point B and distance BP is called. [4]

Question 7

- a. The given diagram shows the refraction of a ray through a prism. [3]



Copy the diagram and ignoring dispersion at the faces AB and AC, mark the following angles:

- (i) The angle of incidence.
 - (ii) The angle of refraction at the face AB,
 - (iii) The angle of emergence, and
 - (iv) The angle of deviation.
- b. i. Differentiate between heat and temperature
ii. Give relation between α , β and γ [3]
- c. State and explain the factors affecting the loudness. [4]

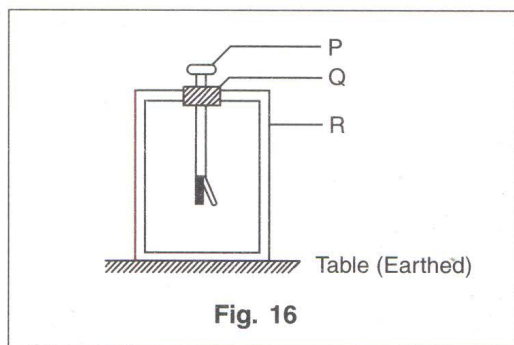
Question 8

- a. Explain how the following factors affect the rate of evaporation of a liquid:
- (i) Temperature of the liquid.
 - (ii) Area of the exposed surface.
 - (iii) Moisture in the surrounding air. [3]
- b. A metal plate is heated. State and explain three factors on which the thermal expansion of the plate depends and name the type of expansion taking place in it. [3]
- c. Draw displacement - time graph and displacement - distance graph of sound wave and show on it amplitude, Time period and wave length. [4]

Answer key

Question 1

- a. State laws of refraction of light. [2]
Ans. According to Snell's law, the ratio of the sine of the angle of incidence and sine of the angle of refraction is equal to a constant for the same pair of media. This constant ratio is called the Refractive index of the second medium with respect to the first. It is represented by Greek letter μ (mew).
- b. Define the terms:
(i) Amplitude
(ii) Frequency (as applied to sound waves) [2]
Ans. (i) Amplitude is the maximum displacement of an oscillating particle of the medium of a periodic wave on either side of the mean position. It is represented by 'a' or 'A', its SI unit is metre.
(ii) Frequency is the number of complete wavelengths traversed by a wave per second. It is represented by ν . Its SI unit is hertz (Hz).
- c. A given liquid changes into the gaseous state at a fixed temperature as well as at all temperatures. [2]
(i) Name the process that takes place in each of the above two cases.
(ii) Mention two points of difference between the two cases in (i) above.
Ans. (i) The change of a liquid into gaseous state taking place at a fixed temperature is called ebullition or boiling.
The change of liquid into gaseous state taking place at all the temperatures is termed as evaporation.
- d. In each case, state which body loses electron:
i. A glass rod is rubbed with silk.
ii. An ebonite rod is rubbed with fur. [2]
- e. In the figure given below label the parts P, Q and R and name the instrument. [2]



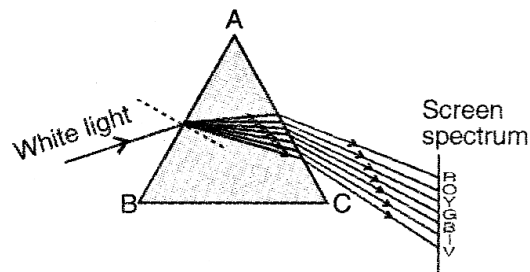
Ans

- .P = Brass disc (cap) [1]
Q = Insulator plug [1]
R = Glass bottle [1]

Question 2

a. Draw a diagram to show that white light can be split up into different colours.

Ans.



b. What change, if any, would you expect in the characteristics of a musical sound when we increase: (i) its frequency, (ii) its amplitude? [2]

Ans. (i) Pitch of the musical sound increases.
(ii) Loudness of the musical sound increases.

c. You have just paid the electricity bill for your house,
(i) What was it that your family consumed for which you had to pay?
(ii) In what unit was it measured? [2]

Ans. (i) We consumed electric energy for which we had to pay.
(ii) It was measured in Board of Trade (B.O.T.) unit or kW

d. What do you mean by conservation of charges? [2]

Ans. Before rubbing the two objects, each object is uncharged, so the net charge is zero. Now when two objects are rubbed together, both are charged equally, but the charges on them are of opposite kinds. Thus the total charges of the objects before and after rubbing remain the same. This is called the conservation of charges.

e. What is an electroscope? Name two types of electroscope. [2]

Ans. An electroscope is a device which is used to detect the presence and nature of charge on a body.

Types of electroscopes

- i. pith ball electroscope and
- ii. Gold leaf electroscope.

Question 3

a. Two friends were playing on identical guitars whose strings were adjusted to give notes of the same pitch. Will the quality of the two notes be the same? Give a reason for your answer. [2]

Ans. No, because both the guitars emit the same fundamental note but subsidiary notes will not be exactly the same due to which the waveform of the two guitars will be different so they will differ in quality.

b. What is the effect of increase in pressure on the melting point of ice and boiling point of water? [2]

Ans. The effect of increase of pressure on the melting point of ice lowers the melting point. The effect of increase of pressure on the boiling point of water increases the boiling point.

c. What is earthing? What is its use? [2]

Ans. Earthing is safety device used to prevent shocks due to –

- (a) leakage; breakdown of element,
- (b) short-circuiting.

Earthing means the metal body of the appliance is connected to thick copper wire, which is buried deep in moist earth and its lowered end is joined to copper plate surrounded by a mixture of common salt and charcoal.

Earth terminal is connected to the body of the electric appliance. Whenever live wire touches the body of electric appliance, it gets connected to the earth through earth wire.

Thus, person touching the appliance accidentally does not suffer

d. How is M.C.B is superior to the fuse wire? [2]

Ans. They switch off the circuit in a very short time nearly 25 ms. And no need to change wire like in fuse.

e. State two precautions to be taken while using electricity. [2]

Ans. i. should not repair the appliances when they are in use

ii. we should ensure that all the appliances are properly earthed.

Question 4

a. Why does evaporation always produce cooling? [2]

Ans. Evaporation always produces cooling as some heat is required to evaporate the liquid. This heat is taken from surroundings and thus surroundings get cooled

b. Does the boiling point of water change with altitude? If so, how? [2]

Ans. Yes, the boiling point of water decreases with the increase of altitude above sea-level. The atmospheric pressure goes on decreasing as height above sea-level increases.

c. Name the material used for making a fuse wire. State two properties of the material of fuse wire which make it suitable for use. [2]

Ans. The material generally used for 'fuse wire' is an alloy of lead and tin. Two common properties of a material suitable to be used are:

(1) High resistance and

(2) Low melting point.

d. Score off the incorrect words and write correctly the following:

In wiring a three pin plug, the brown sleeved wire is connected to the neutral/live pin and green/blue wire is connected to metal body of the appliance. [2]

Ans. In wiring a three pin plug, the brown sleeved wire is connected to the live pin and the green sleeved wire is connected to the metal body of the appliance.

e. How are the electrical appliances connected in a house circuit; in series or parallel? Give reason [2]

Ans. Appliances are connected in parallel so that all work independently and each one will get same voltage

Question 5

a. (i) What is meant by refraction?

(ii) Express the refractive index n of a medium:

- (1) in terms of the velocity of light;
- (2) in terms of the angle of incidence i in air and the angle of refraction r in a denser medium.

[3]

- Ans.** (i) When light passes from one medium to another medium, the phenomenon of change in the direction of path of light is called refraction.
- (ii) (1) Refractive index n of a medium.

$$n = \frac{\text{Velocity of light in vacuum}}{\text{Velocity of light in medium}}$$

$$(2) \quad n = \frac{\sin i}{\sin r}$$

- b.** A driver uses a convex mirror as rear view mirror. Explain the reason with the help of diagram.

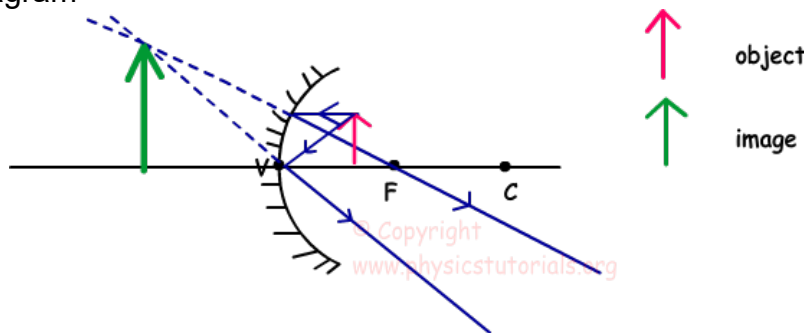
[3]

Ans.

- c.** i. Draw a ray diagram to represent the formation of a magnified and virtual image in a spherical mirror.
- ii. Name the mirror which always gives a virtual and diminished image.
- iii. How will you differentiate the mirrors in question I and ii without touching.

[4]

- Ans.** i. ray diagram



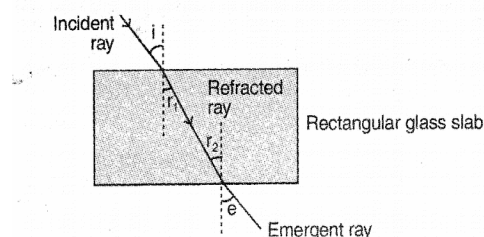
- ii. Convex
- iii. if the image is inverted and real and on bringing the object near to the mirror we get virtual and magnified image then it is concave mirror, if the image always erect and diminished and virtual the mirror is convex.

Question 6

- a.** Draw a ray diagram to illustrate how a ray of light incident obliquely on one face of a rectangular glass slab of uniform thickness emerges parallel to its original direction. Mention which pairs of angles are equal.

[2]

Ans.

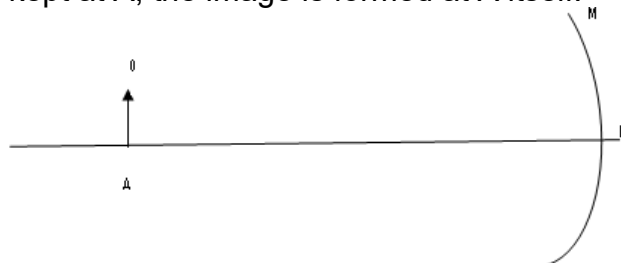


Incident ray and emergent ray are parallel. Angle of incidence (i) and angle of emergence (e) are equal.

b. How lightning is produced? What are its effects? [3]

Ans. Lightning is produced in thunderstorm when liquid and ice particles above the freezing level collide, and build up large electrical fields in the clouds. Once these electric fields become large enough, a giant "spark" occurs between them (or between them and the ground) like static electricity, reducing the charge separation. The lightning spark can occur between clouds, between the cloud and air, or between the cloud and ground.

c. In the diagram given below, M is the concave mirror and A is a point on its principal axis. If an object is kept at A, the image is formed at A itself.

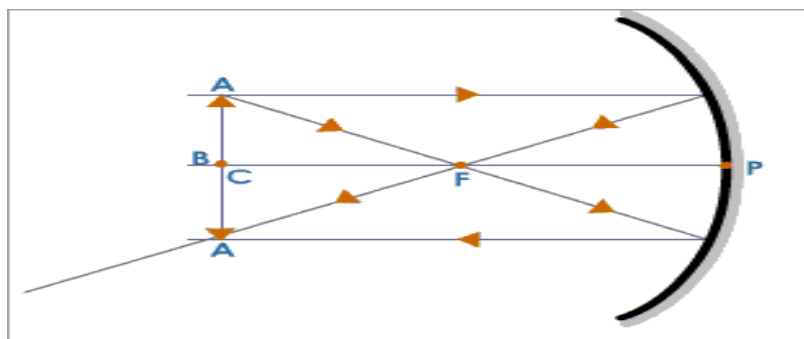


- i. Draw ray diagram to show the image in diagram.
- ii. What is the distance PA is called.
- iii. If B is the midpoint of PA, then what is the point B and distance BP is called.

[4]

Ans.

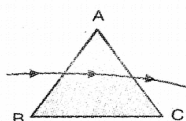
i.



- ii. Radius
- iii. Focus, focal length.

Question 7

a. The given diagram shows the refraction of a ray through a prism. [3]

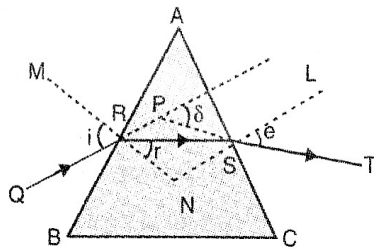


Copy the diagram and ignoring dispersion at the faces AB and AC, mark the following angles:

- (i) The angle of incidence.
- (ii) The angle of refraction at the face AB,

- (iii) The angle of emergence, and
- (iv) The angle of deviation.

Ans.



- b. i. Differentiate between heat and temperature
- ii. Give relation between α , β and γ

[3]

Ans. i.

Heat	Temperature
It is the form of energy	It is a thermal condition of body.
It flows from one body to other	It is a quantity that indicates whether or not and in which direction heat will flow.
It is a total amount of internal energy of a body	It is proportional to average kinetic energy of the molecules of a body.
In the transmission of heat total amount of heat remain unchanged	In the transmission of heat temperature does not remain same.
It is an cause	It is an effect
It SI unit is Joule	It SI unit is Kelvin (K)

- ii. $\alpha : \beta : \gamma = 1:2:3$

- c. State and explain the factors affecting the loudness.

[4]

Ans. **Loudness of sound is directly proportional to**

- (i) square of the amplitude (A^2) of the vibration of the vibrating body.
- (ii) surface area (a) of the medium
- (iii) density (ρ) of the medium.
- (iv) square of the frequency (ν^2) of the source
- (v) inversely proportional to the square of the distance of the listener from the source of sound.

Question 8

- a. Explain how the following factors affect the rate of evaporation of a liquid:

- (i) Temperature of the liquid.
- (ii) Area of the exposed surface.
- (iii) Moisture in the surrounding air.

[3]

- Ans. (i) **Temperature of the Liquid** : The higher temperature of the liquid, increases the number of molecules leaving its surface and, consequently, increases its rate of evaporation.

- (ii) **Area of the Exposed Surface** : The greater the extent of the surface of a liquid exposed to the air, the higher is its rate of evaporation.
- (iii) **Moisture in the Surrounding Air** : The drier the air, the greater the quantity of vapour it can hold at a given temperature and the greater, therefore, the rate of evaporation. If the air is already saturated with vapours, evaporation cannot take place.

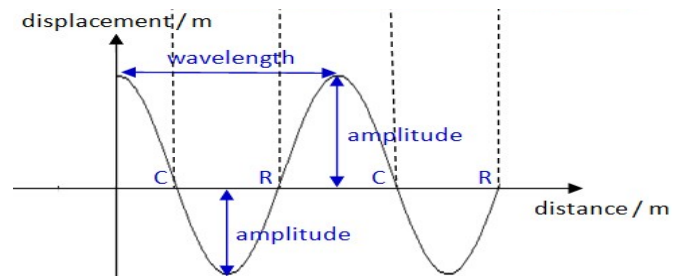
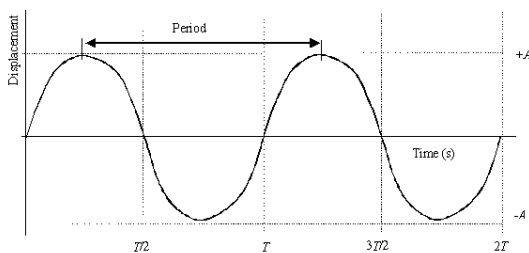
b. A metal plate is heated. State and explain three factors on which the thermal expansion of the plate depends and name the type of expansion taking place in it. [3]

- Ans. Factors
- i. Increase in temperature direct proportion
 - ii. Co efficient superficial expansions direct proportion
 - iii. Original area. Direct proportion

And type of expansion is superficial expansion.

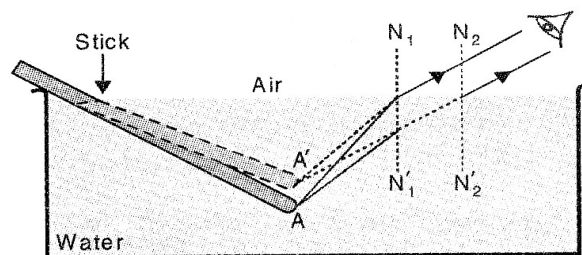
c. Draw displacement - time graph and displacement - distance graph of sound wave and show on it amplitude, Time period and wave length. [4]

Ans.



Q.14. Draw a ray diagram to illustrate the bending of a stick in water.

Ans.



Bending of stick in water.

Q.3. Explain why musical instruments like the guitar are provided with a hollow box. [2006]

Ans. Musical instruments like guitar are provided with a hollow box because vibrating strings Of the instruments produce a very weak sound which cannot be heard. But strings set

into vibration produce forced vibrations in the large volume of air filled in the hollow box and thus loud sound of the frequency matching with the frequency of the vibrating string is produced.