Estd. 1861

# BOYS' HIGH SCHOOL AND COLLEGE
## THIRD TERM EXAMINATION (2023-24)
## PHYSICS
## CLASS – IX

**M.M:80**

**(Two hours paper)**
**SECTION – A (40 Marks)**
**(Attempt all questions from this section)**

**Question 1**

Choose the correct answer to the questions from the given options: [15]

i) The unit for measuring potential difference is _____
   a) watt  b) ohm
   c) volt  d) ampere

ii) The thrust exerted by a body placed on a surface is _____
   a) less than the weight of the body  b) more than the weight of the body
   c) equal to the weight of the body  d) independent of the weight of the body

iii) Altimeter is used in an aircraft to measure _____
   a) Atmospheric pressure  b) Altitude
   c) Speed  d) Distance travelled

iv) With an increase in the density of the fluid, the upthrust experienced by a body immersed in it _____
   a) increases  b) decreases
   c) remains the same  d) none of the above

v) Rheostat is used in a circuit to provide _____
   a) fixed current  b) fixed voltage
   c) fixed resistance  d) variable resistance

vi) Potential difference between two conductors is 20 V. How much is the work done in moving 0.2 C of charge from one conductor to another?
   a) 2 joule  b) 6 joule
   c) 8 joule  d) 4 joule

vii) Which of the following is a scalar quantity?
   a) Force  b) Pressure
   c) Acceleration  d) Displacement

viii) The number of oscillations made in one second is called _____
   a) Amplitude  b) Time period
   c) Frequency  d) Wavelength

ix) The property of an object by virtue of which it tends to retain its state of rest or motion is called _____
   a) Friction  b) Inertia
   c) Linear momentum  d) Acceleration

x) The sum of all magnetic fields add up to zero at the _____
   a) North pole  b) South pole
   c) Equator  d) Neutral points

xi) The speed of sound in air at 0° C is nearly _____
   a) 450 m/s  b) 220 m/s
   c) 5100 m/s  d) 330 m/s

xii) Geothermal energy is the energy possessed by _____
   a) Tides  b) Wind
   c) Rocks  d) Biomass

xiii) If the resistance of a wire is 2 Ω and the current in the wire is 1.5 A. The potential difference across the ends of wire is _____
   a) 3 V  b) 2 V
   c) 6 V  d) 0.5 V

xiv) The unit of relative density is _____
   a) $g/cm^3$  b) $kg/m^3$
   c) $m^3/kg$  d) no unit

xv) Every ship has a white line painted on its side known as _____
   a) Plimsoll line  b) Border line
   c) Harbour line  d) Level line

**Question 2**

(i) (a) Define electrical resistance. [3]
(b) What are conductors and insulators of electricity?
(c) Give any two examples of conductors and insulators.
(ii) Why isn't water considered an ideal choice for use as a barometric liquid? [2]
(iii) State the principle of floatation. [2]
(iv) A pebble thrown vertically upwards with an initial velocity 50 m/s comes to a stop in 5 seconds. Find the retardation. [2]
(v) Write any two laws of liquid pressure. [2]
(vi) What do you mean by renewable sources of energy? Name any two renewable sources. [2]
(vii) The radius of curvature of a convex mirror is 50 cm. Find its focal length. [2]

**Question 3**

(i) A current of 15 A flows through a conductor for 20 s. Find the amount of charge passing through the conductor. [2]
(ii) Define the term Neutral point. [2]
(iii) State Archimedes' principle. [2]
(iv) Differentiate between density and Relative density of a substance. [2]

(v) Calculate the wavelength of a sound wave whose frequency is 200 Hz and velocity is 440 m/s in a given medium. [2]

## SECTION – B (40 Marks)

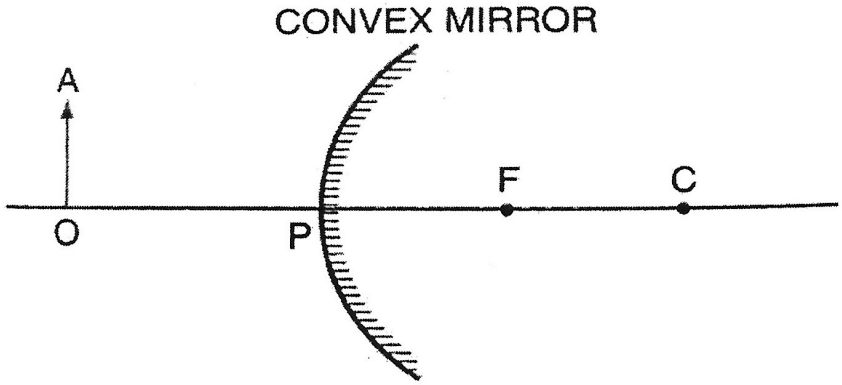
(Attempt any **four** questions from this section)

**Question 4**

(i) State any three differences between primary and secondary cells. [3]
(ii) Write three equations of motion relating the initial velocity 'u', final velocity 'v', time 't', acceleration 'a' and displacement 'S'. [3]
(iii) A press plunger of a hydraulic machine has an area of the cross-section as 5 $m^2$ is required to go against a load of 500 kgf. Calculate the force required on the pump plunger, given its area of the cross-section as 0.02 $m^2$. [4]

**Question 5**

(i) Explain why a dam has broader walls at the bottom than at the top. [3]
(ii) The diagram given below shows a convex mirror. [3]
a) Draw two rays from A and hence locate the position of image.
b) State three characteristics of the image.




(iii) Calculate the liquid pressure exerted by a column of water of height 0.8 m and given density of water as 1000 $kg/m^3$. (Take g=9.8 $m/s^2$) [4]

**Question 6**

(i) Explain how does the resistance depends on: [3]
a) Length of a conductor
b) Area of cross-section of a conductor

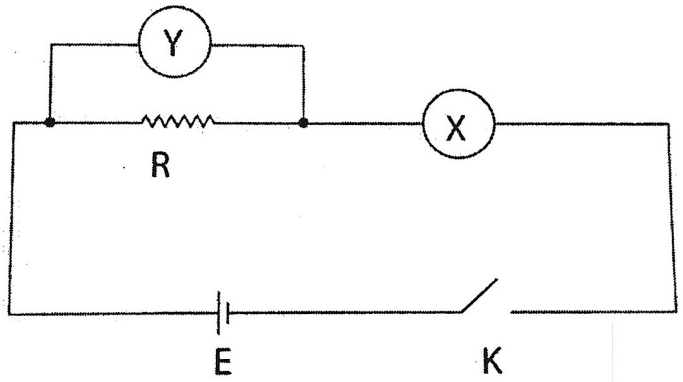
c) Temperature of a conductor

(ii) Name two factors on which the Time period of a simple pendulum depends. Write the relation/formula for the Time period in terms of the above named factors. [3]

(iii) A small cube of volume 125 $cm^3$ is made of a metal with a mass of 1150 g is completely immersed in a liquid of density 5 $g/cm^3$. Find:
a) Upthrust on the cube in gf
b) Apparent weight [4]

**Question 7**

(i) In the electric circuit shown in the figure, what do the letters X and Y symbolize? Define each term stated. [3]




(ii) Write any three applications of ultrasound. [3]

(iii) A block of wood of volume 50 $cm^3$ floats on water with 10 $cm^3$ of its volume immersed under water. Calculate the density of the block. (Take density of water= 1 $g/cm^3$) [4]

**Question 8**

(i) State the functions of each of the following components in an electric circuit: [3]
a) Key
b) Load
c) Galvanometer

(ii) Derive an expression for the pressure exerted by a liquid column having density ρ, at a depth h and acceleration due to gravity g. [3]

(iii) A piece of iron of density $6x10^3$ $kg/m^3$ and volume $10^{-4}$ $m^3$ is completely immersed in water ($\rho$= 1000 $kg/m^3$). Calculate: [4]
a) mass of the piece of iron
b) Weight of iron piece in air (in kgf)
c) Upthrust (in kgf)
d) Apparent weight

**Question 9**

(i) Mention three demerits of a simple barometer. [3]

(ii) Write any three uses of electromagnets. [3]

(iii) Give reason for the following: [4]
a) An iron nail sinks in water while an iron ship floats on water.
b) A balloon filled with hydrogen rises to a certain height and then stops rising further.

**********