

IX (ICSE)
Full Marks : 80

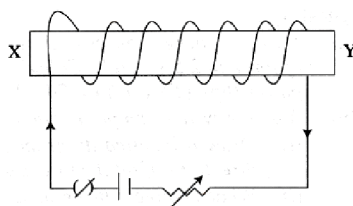
Physics Full Syllabus Test

Time : 2 hrs.

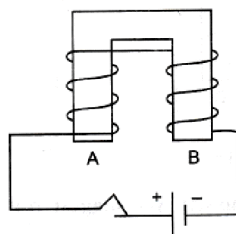
(Attempt any eight questions)

1. (a) Draw ray diagrams showing the image formation by convex mirror and predict the nature of the image when an object is placed at (i) infinity (ii) at finite distance from the mirror. (3 + 3)
 (b) An object 2 cm in size is placed 30 cm in front of a concave mirror of focal length 15 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image? What will be the nature and size of the image formed? (2 + 1 + 1)
2. (a) State and explain Ohm's law. Draw its graph. 2
 (b) State the factors affecting the resistance of a conductor. 3
 (c) How does temperature affect the resistance of a conductor. 2
 (d) What happens when (i) resistances are joined in series and (ii) resistances are joined in parallel? 3
3. (a) A wave has a speed of 240 m/s and a wavelength of 3.2m. What are the (i) frequency and (ii) period of the wave? 3
 (b) Explain, why a distant lightning flash is seen before the thunder is heard. 2
 (c) State how temperature, pressure and moisture affect the speed of sound in air. 3
 (d) Why can we not hear each other on the moon? 2
4. (a) State the Principle on which a hydraulic machine works. 2
 (b) Explain the working of rubber suckers? 2
 (c) How is the barometric height of a simple barometer affected if (i) the tube is pushed down into the trough of mercury? (ii) its tube is slightly tilted from vertical? (iii) a drop of liquid is inserted inside the tube? 3
 (d) What length of water column is equivalent to 0.76 m of mercury column? State the assumption taken for the problem. 3
5. (a) A body is dropped from the top of a tower. It acquires a velocity of 20m/s on reaching the ground. Calculate the height of the tower. ($g = 9.8 \text{ m/s}^2$) 3
 (b) How long would a force of 30 N act on a body of mass 10kg so that the body gains a velocity of 24m/s? 2
 (c) A car moves with an average speed of a m/s during the first half of its journey and b m/s during the rest half of its journey. Calculate the average speed over the entire journey. 3
 (d) A body has a mass of 20kg on earth. What is the mass and weight on moon? 2

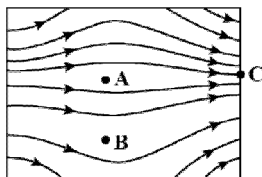
6. (a) The figure given below shows an electromagnet.



- (i) What will be the polarity at the end X? 2
- (ii) Suggest a way by which the strength of the electromagnet referred to in the question, may be increased.
- (b) (i) What is the name given to a cylindrical coil, whose diameter is less in comparison to its length? 1
- (ii) A piece of soft iron is placed inside the current carrying coil, what is the name given to the device? 1
- (iii) Give two uses of the device named by you in part (ii) above. 2
- (c) The diagram shows a coil wound around a U-shape soft iron bar AB.



- (i) What is the polarity induced at the ends A and B when the switch is pressed? 1
- (ii) Suggest one way to strengthen the magnetic field in the electromagnet. 1
- (iii) What will be the polarities at A and B, if the direction of current is reversed in the circuit? 1 + 1
7. (a) (i) Unlike poles _____, while like poles _____ each other. 2
- (ii) The magnetism is minimum _____ in a bar magnet. 1
- (iii) A freely suspended magnet rests in the geographic _____ direction. 1
- (b) How will you test whether a given rod is made of iron or copper? 2
- (c) You are provided with two similar bars, one is a magnet and the other is a soft iron. How will you distinguish between them without the use of any other magnet or bar? 2
- (d) Figure shows the magnetic field lines in a magnetic field. A, B and C are three points in this field. 2



- (i) At what point is the magnetic field strongest?
- (ii) At what point is the magnetic field weakest?

Give reasons for your answer.

8. (a) State the effect of temperature on the density of a substance. 2
 (b) What do you mean by anomalous expansion of water? 2
 (c) At what temperature the density of water is maximum? State its value. 2
 (d) Draw a graph to show the variation in density of water with temperature in the range from 0°C to 10°C . 2
 (e) A given mass of water is cooled from 10°C to 0°C . State the volume changes you will observe. Represent these changes on a temperature-volume graph. 2
9. (a) A car travels a distance 50 km with a velocity 25 km h^{-1} and then 60 km with a velocity 20 km h^{-1} in the same direction. Calculate: (2 + 2)
 (i) the total time of journey and
 (ii) the average velocity of the car.
 (b) A car travels with a uniform velocity of 20 ms^{-1} for 5 s. The brakes are then applied and the car is uniformly retarded. It comes to rest in further 8 s. Draw a graph of velocity against time. Use this graph to find:
 (i) the distance travelled in first 5 s (2 + 1 + 1 + 1 + 1)
 (ii) the distance travelled after the brakes are applied
 (iii) total distance travelled
 (iv) acceleration during the first 5 s and last 8 s.
10. (a) (i) An incident ray makes 60° angle with the surface of the plane mirror then the angle of reflection is _____. 1
 (ii) If the linear magnification in case of spherical mirror is greater than one, then the image formed is _____. 1
 (iii) The magnification of image in case if an object placed 10 cm in front of a concave mirror of radius of curvature 15 cm is _____. 1
 (iv) A ray of light falling normally on a mirror reflect by _____ angle. 1
 (v) If an object is placed between two plane mirrors inclined at 30° to each other then the number of images formed is _____. 1
 (b) An object is at a distance 25 cm in front of a plane mirror. The mirror is shifted 5 cm away from the object. Find : (i) the new distance between the object and its image, and (ii) the distance between the two positions of the image. 3
 (c) The letter on the front of an ambulance are written laterally inverted like **AMBULANCE**. Give reason. 2
11. (a) (i) Sound can not travel through _____, but it requires a _____. 2
 (ii) When sound travels in a medium, the particles of medium _____ but the disturbance _____. 2
 (iii) A longitudinal wave is composed of compression and _____. 1
 (iv) A transverse wave is composed of crest and _____. 1

- (b) The sound of an explosion on the surface of a lake is heard by a boat man 100 m away and by a diver 100 m below the point of explosion. 3
- (i) Who would hear the sound first : boat man or driver?
- (ii) Give a reason for your answer in part (i).
- (iii) If sound takes time t to reach the boat man, how much time approximately does it take to reach the driver?
- (c) Name one longitudinal wave and one transverse wave 1
12. (a) Can you hear the sound produced due to vibrations of a seconds pendulum? Give reason. 2
- (b) State two properties of ultrasound that make it useful to us. 2
- (c) A conductor carries a current of 0.2 A. (i) Find the amount of charge that will pass through the cross section of conductor in 30 s. (ii) How many electrons will flow in this time interval if charge on one electron is 1.6×10^{-19} C? 2
- (d) State the cause of increase of green house effect. 2
- (e) A body experiences an upthrust F_1 in river water and F_2 in sea water when dipped up to the same level. Which is more F_1 or F_2 ? Give reason. 2
13. (a) Why is a force needed to keep a block of cork inside water? 2
- (b) A sphere of iron and another of wood, both of same radius are placed on the surface of water. State which of the two will sink? Give reason to your answer. 2
- (c) It is easier to lift a heavy stone under water than in air. Explain. 2
- (d) State Archimedes' principle. 2
- (e) A block of wood floats on water with $\frac{2}{5}$ th of its volume above the water surface. Calculate the density of wood. 2
14. (a) (i) 1 light year = _____ m. 1
- (ii) 1 m = _____ Å. 1
- (iii) 1 m = _____ μ (micron). 1
- (iv) 1 micron = _____ Å. 1
- (b) Compare the time periods of two simple pendulums of length 1 m and 16 m at a place. 2
- (c) Compare the time periods of a simple pendulum at places where g is 9.8 ms^{-2} and 4.36 ms^{-2} respectively. 2
- (d) Write the derived units of the following: 2
- (i) speed (ii) force (iii) Work (iv) pressure