Physics – Mock Test Paper

[Time: $1\frac{1}{2}$ hrs] **[M. Marks : 80]**

Answers to this paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the Question Paper.

The time given at the head of this paper is the time allowed doe writing the answers.

Section I is compulsory. Attempt any **four** questions from **Section II**.

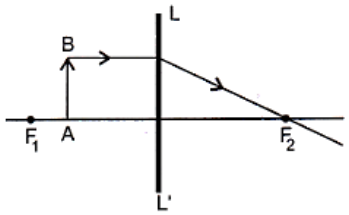
Section I (40 Marks)

Attempt all questions from this section

Question 1.

(a) Explain, why no tracks are left on the ice during ice skating.

(b) Study the given diagram and answer the following questions.



(i) Name the lens LL'.

(ii) What are the points F_1 and F_2 called ?

(iii) Between what points will the image of the object AB be formed ?

(4) What is the nature of the image ?

(c) Why does evaporation causes cooling and why is water used in hot water bottles ?

(d) Define an include plane.

Question 2.

(a) How will you proceed experimentally to find the relative density of a cork ? State the observations and calculations.

(b) Define a Watt. How is it related to the ampere and volt ?

(c) A lamp is marked 15 V, 30 W. How many joule does it consume in one hour and what is the current that passes through it ?

(d) Name the type of system used for house-hold wiring.

(e) Two bulbs are marked 60 W, 220 V and 60 W, 110 V respectively.

(i) Calculate the ratio of their resistance.

(ii) If they are connected in parallel, calculate the total current drawn from the supply.

Question 3.

(a) Give the role of each of the three terminals of a three way pin plug.

(b) State the reason why, in a three pin plug, the earth pin is longer and thicker than the other two.

(c) What purpose is served by the terminals of a three way pin plug ?

(d) State two advantages of filling an inert gas in an evacuated electric filament lamp.

(e) Mosquitoes produce music. Explain ?

Question 4.

(a) Can a body have momentum without energy ?

(b) What do you mean by chain reaction ?

(c) Calculate the number of protons and neutrons in $^{235}_{92}U$ and $^{236}_{88}Ra$.

(d) A d.c. motor is rotating in anticlock wise direction. How can the direction of rotation be reversed ?

(e) What is the function of carbon brushes ?

SECTION—II (40 Marks)

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

Question 5.

(a) Define latent heat of fusion.

(b) How much heat is needed to melt 15 kg of ice at 9°C ?

(c) 10 kg of steam at 100°C is condensed to form water. It is then cooled to 0°C and finally frozen into ice at 0°C. Calculate the total amount of heat released.

Question 6.

(a) On a see-saw, two children masses 30 kg and 50 kg respectively are sitting on one side of it at distances 2 m and 3 m respectively from its middle. Where should a man of mass 75 kg sit to balance it ?

(b) In what condition a prism is said to be in the position of minimum deviation ? What is the direction of the refracted ray inside the prism in this conditions ?

(c) Define the term magnifying power of a simple microscope. How does it depend on the focal length of the lens used ?

Question 7.

(a) When a vehicle is driven at a high speed, sometimes rattling sound is heard. Explain, why ?

(b) Define :

(i) Fundamental notes (ii) Overtones and (iii) Harmonics

(c) What do you understand by the term "quality of musical note" ? Illustrate your answer with a diagram.

Question 8.

(a) Describe, how does a colour triangle help us to understand the correlation between various colours ?

(b) Draw ray diagrams for the images formed by a convex lens when the position of the object is :

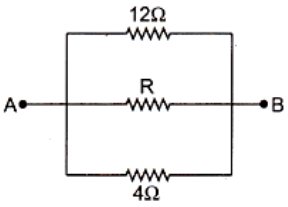
(i) at infinity, (ii) beyond 2F, and complete the following table.

Position of the Object	Nature of Image			Position of the Image
	Real or Virtual	Erect or Inverted	Diminished or Enlarged	
At infinity Beyond 2F				

Question 9.

(a) Define the unit of current.

Correct the following sentence : "Ohm's law is valid for all/certain types of resistance".



(b) Find the value of R in the following figure if equivalent resistance between the terminals A and B is 2Ω.

(c) A house is fitted with 20 lamps of 60 watt each, 10 fans consuming 0.5 Ampere each and an electric kettle of resistance of 110Ω. If the energy is supplied at 220 V and costs RS. 2.25 per kWh. Calculate the bill for November while running these appliances for 6 hours a day.

Question 10.

(a) State the condition when it is advantageous to connect cells—

(i) in series, and (ii) parallel.

(b) Which are the processes that can take place after the neutrons are emitted in a fission reaction. Which one of them will lead to a chain reaction ?

(c) (i) What do you understand by the subscript and superscript in ${}_{92}U^{235}$?

(ii) Complete the following reaction using the appropriate subscript or superscript, where missing :

$$_{92}U + {}_{0}n^{1} \longrightarrow {}_{\cdots}B^{141} + {}_{36}Kr^{\cdots} + 3{}_{0}n^{1}$$