First Term Examination, August 2020-21

Grade: 10 **PHYSICS** **Marks: 80**

Time: 2 Hour

Section I is compulsory. Attempt any four questions from section II. The intended marks for questions or parts of questions are given in brackets ( ).

SECTION - I (40 MARKS)

(ATTEMPT ALL QUESTIONS)

Question 1

a. Define moment of force. State its S.I unit. (2)

b. State two conditions for the work done by a force to be zero. (2)

c. A fuse wire is always connected in the live wire of the circuit. Explain the reason. (2)

d. How will you differentiate between a convex and a concave lens by touching? (2)

e. Name the form of energy which a body may possess even when it is not in motion. Give an example to support your answer. (2)

Question 2

a. State the energy changes in the following cases while in use : (2)

(i) Loudspeaker

(ii) Washing machine

b. A ray of light falls normally on a rectangular glass slab. Draw a ray diagram showing the path of the ray till it emerges out of the slab. (2)

c. (2)

(i) What is the purpose of switch in a circuit?

(ii) What precaution do you take while handling a switch?

d. The magnification of a lens is -3. Name the lens and state how u and v are related? (2)

e. State two conditions necessary for total internal reflection to occur. (2)

Question 3

a. State two differences between centripetal and centrifugal force. (2)

b. Define watt hour. How is it related to joule? (2)

c. Name the colour code of the wire which is connected to (i) metallic body of an appliance, (ii) switch for the appliance. (2)

d. Where should an object be placed in front of a convex lens in order to get : (2)

(i) An enlarged real image

(ii) An enlarged virtual image

e. A nut is opened by a wrench of length 10 cm. If the least force required is 5 N, find the moment of force needed to turn the nut. (2)

Question 4

a. A ball is placed in a compressed spring. What form of energy does the spring posses? On releasing the spring, the ball flies away. Give a reason. (2)

b. State the principle of moments. Name one device based on it. (2)

c. State two applications of a convex lens. (2)

d. State two precautions to be taken to avoid electric shock. (2)

e. **A coin is placed at the bottom of a beaker containing water (refractive index = 4/3) at a depth of 12 cm. By what height the coin appears to be raised when seen from vertically above? (2)**

SECTION - II (40 MARKS)
(ATTEMPT ANY FOUR QUESTIONS)

Question 5

a.

(i) The work done by a fielder when he takes a catch in a cricket match is negative. Explain.

(ii) State two factors on which power spent by a source depends. (3)

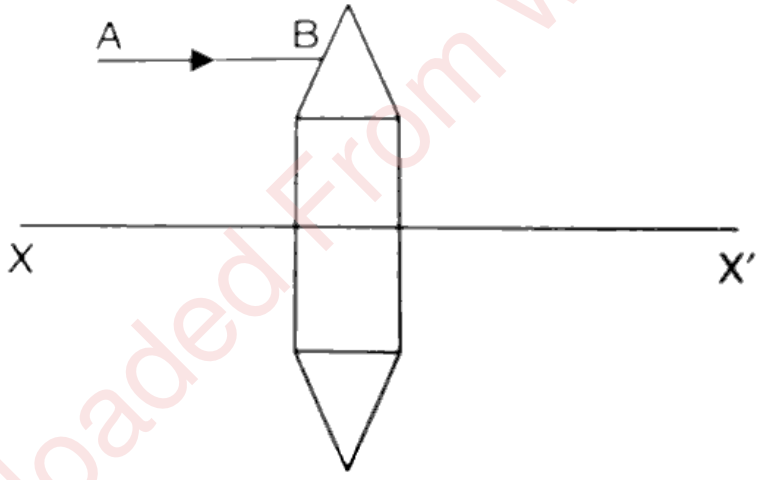
b. A lens of focal length 20 cm forms an inverted image at a distance 60 cm from the lens. (3)

(i) Identify the lens.

(ii) How far is the lens present in front of the object?

c. Explain about the term critical angle. (2)

d. The diagram below shows a lens as a combination of a glass slab and two prisms.



(i) Name the lens formed by the combination.

(ii) What is the line XX' called?

(iii) Complete the ray diagram and show the path of the incident ray AB after passing through the lens. (2)

Question 6

a. State two disadvantages of connecting the appliances in series. (2)

b. A spanner has a long handle. Why? (2)

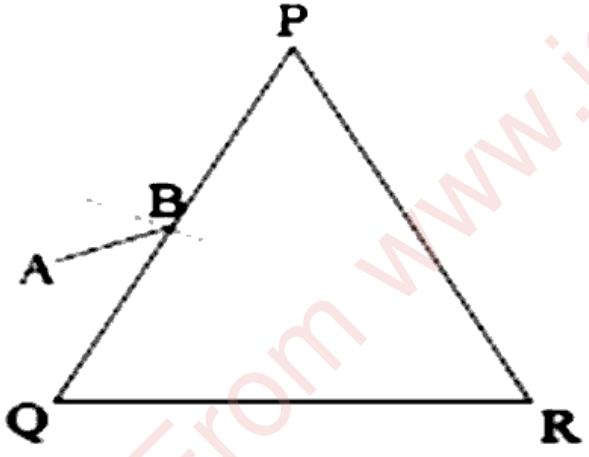
c. Give two examples for the conversion of potential energy into kinetic energy. (2)

d. A uniform metre rule balances horizontally on a knife edge placed at the 58 cm mark when a weight of 20 gf is suspended from one end.

(i) Draw a diagram of the arrangement.

(ii) What is the weight of the rule? (2)

e. Complete the path of the monochromatic light ray AB incident on the surface PQ of the equilateral glass prism PQR till it emerges out of the prism due to refraction. (2)



Question 7

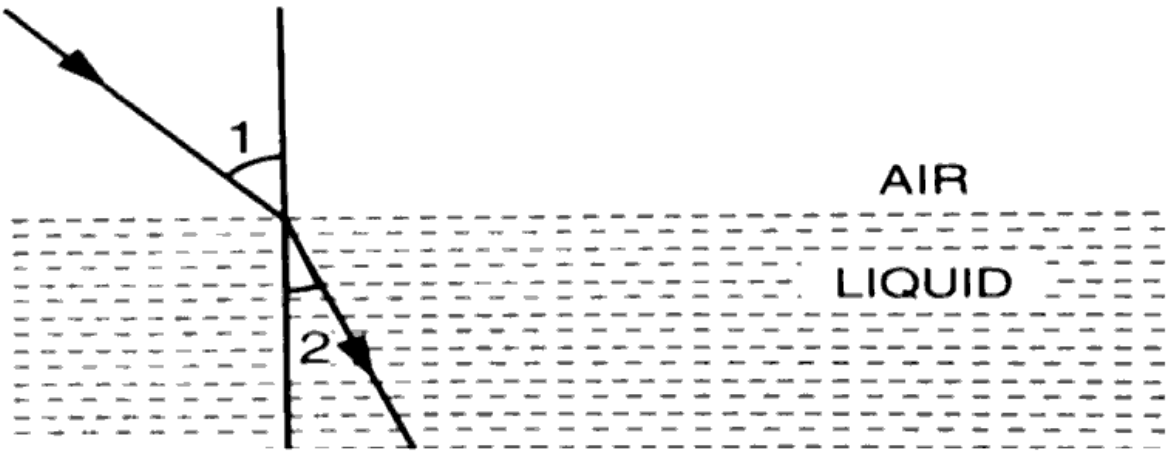
a. Explain about static and dynamic equilibrium. (2)

b. State the two laws of refraction. (2)

c. 'Uniform circular motion is an accelerated motion'. Comment on this statement. (2)

d. An electric kettle is rated 3 kW, 250 V. Give reason whether this kettle can be used in a circuit which contains a fuse of current rating 13 A. (2)

e. A ray of light enters a liquid from air, as shown in figure. Angle 1 is 45° and angle 2 is 30°. (2)



Find the refractive index of liquid with respect to air.

Question 8

a. Define the terms principal axis and focal length of a lens. (2)

b. (2)

(i) The diagram below shows a three pin socket marked as 1, 2, and 3. Identify and write live (L), neutral (N) and earth (E) against the correct number.

(ii) Name the part of the appliance which is earthed.

c. A body of mass 60 kg has momentum of 3000 kg ms^{-1}. Calculate : (2)

(i) the kinetic energy and

(ii) the speed of the body.

d. State two factors on which angle of deviation of a prism depends. (2)

e. A convex lens forms an image of an object equal to the size of the object. (2)

(i) Where is the object placed in front of the lens?

(ii) Draw a ray diagram to illustrate it.

Question 9

a. 'The use of MCB is more convenient than a fuse wire'. Give two reasons for this statement. (2)

b. State three differences between real and virtual images. (3)

c. A man raises a box of mass 50 kg to a height of 2 m in 20 s., while another man raises the same box to the same height in 50 s. Compare (2)

(i) the work done by them.

(ii) the power developed by them.

d. Define one joule of work. (2)

e. State two characteristics of a high tension wire. (1)

Question 10

a. A body falls freely under gravity from rest. Name the kind of energy it will possess. (3)

(i) at the point from where it falls.

(ii) while falling

(iii) on reaching the ground

b. (3)

(i) What is the cause of refraction of light when it passes from one medium to another?

(ii) The speed of light in air is 3×10^8 m s^{-1}. Calculate the speed of light in glass. The refractive index of glass is 1.5.

c. (2)

(i) Name the material of a fuse wire.

(ii) Two fuse wires are rated 5 A and 20 A. Which of the two is thicker? Give reason

d. (2)

(i) Define the term power of a lens.

(ii) The power of a lens is negative. State whether it is convex or