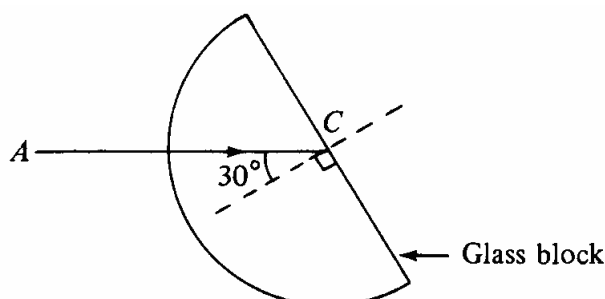


Physics Quiz 3:

Name: _____ Class No.: _____ Marks: _____ / 26

- Instructions:
1. Time allowed: 20 minutes
 2. Write down all the answers on the answer sheet.
 3. All answers have to be corrected to 2 decimal places.



1. Figure 1 shows a ray of red light entering a semicircular glass block in the direction AC. The angle of incidence at C is 30° . The critical angle of red light for the glass block is 39° .
 - (a) How would the direction and the speed of the ray be affected when it enters the glass block? (2 marks)
 - (b) When the ray reaches C, it splits into two. Copy the diagram above on your answer sheet and sketch the two rays. (3 marks)
 - (c) Calculate
 - (i) the refractive index of the glass block,
 - (ii) the angle of refraction of the ray on leaving the glass block. (4 marks)
 - (d) What happens if the ray reaches C with an angle of incidence is 42° (i.e. the value greater than the critical angle in glass) from air to glass? Draw a ray diagram to support your answers. Please note that all the values of the angles have to be stated. (8 marks)
 - (e) Assuming the speed of the red light in air is $3 \times 10^8 \text{ ms}^{-1}$, Calculate the speed of the red light in glass block. (2 marks)
 - (f) A periscope consists of two right-angled prisms.
 - (i) Draw a ray diagram to show how the periscope works.
 - (ii) What is the advantage of using two right-angled prisms over two plane mirrors? Explain your answers with a ray diagram. (7 marks)

The End.