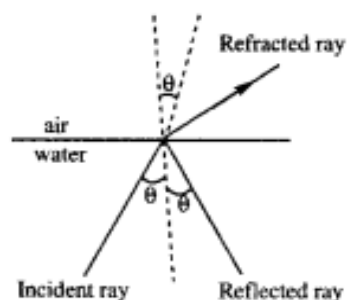


A ray of light travelling in water is incident on its surface open to air. The angle of incidence is θ , which is less than the critical angle. Then there will be **[2007-3 marks]**

- a) only a reflected ray and no refracted ray
- b) only a refracted ray and no reflected ray
- c) a reflected ray and a refracted ray and the angle between them would be less than $180^\circ - 2\theta$
- d) a reflected ray and a refracted ray and the angle between them would be greater than $180^\circ - 2\theta$

Sol-

(c) The ray is incident on the interface of a rarer medium (air) from a denser medium (water), and the angle of incidence is less than the critical angle. The ray will be partly refracted and partly reflected



Also, the Snell's law $\mu_1 \sin \theta_1 = \mu_2 \sin \theta_2$ tells that the angle of refraction will be more than the angle of incidence, on entering the air the ray will bend away from the normal. See the diagram.

The angle between the reflected and the refracted ray is less than $180^\circ - 2\theta$