(v) Sketch out three differences between Interference and diffraction of light.

(vi) State Huygens's principle. Also distinguish between a wave-front and a wavelet by graphical sketch. (Graph paper is not required)

(vii) A glass light pipe in air will totally internally reflect a light ray if its angle of incidence is at least 39°. What is the minimum angle for total internal reflection if pipe is in water? (The refractive Index of water is 1.33)

(viii) Define Near Point, Resolving Power and Continuous Refraction.

(ix) Why do we say that molar specific heat at constant pressure is greater than molar specific heat at constant Volume? ($C_p > C_v$)

(x) A steam engine has a boiler that operates at 450 k. The heat changes water to steam, which drives the piston. If the exhaust temperature of the outside air is about 300 k then calculate maximum efficiency of this steam engine?

SECTION - D (Marks 26)

Note: Attempt any TWO questions. All questions carry equal marks.

(13×2 = 26)

Q.4 a. Define Absolute Potential energy. Derive relation for Absolute P.E of body having mass 'm' at distance 'r' from the centre of the earth. (1+5)

b. What is the gravitational field? Also discuss the factors on which work done by anybody in conservative field depends. (1+3)