

Q1. Define refractive index of a medium. [1]

Q2. What is the velocity ratio of a single movable pulley? [1]

Q3. State two differences between single fixed pulley and single movable pulley. [2]

Q4. What is the cause of refraction of light when it passes from one medium to another? [2]

Q5. Name two factors on which the refractive index of a medium depends? State how does it depend on the factors stated by you. [3]

Q6. A pulley system has a velocity ratio 3 and an efficiency of 80%. Draw a labeled diagram of this pulley system. Calculate: [3]

a) The mechanical advantage of the system and

b) The effort required to raise a load of 300 N.

Q7. [2+2]

a). For which colour of white light, is the refractive index of a transparent medium

i) the least, ii) the most?

b) The refractive index of water is  $\frac{4}{3}$  and of glass is  $\frac{3}{2}$ . What is the refractive index of glass with respect to water.

Q8. A block and tackle has two pulleys in each block, with the tackle tied to the hook of the lower block and the effort being applied upwards. [2+2]

a) Draw a neat diagram to show this arrangement and calculate its mechanical advantage.

b) If the load moves up a distance  $x$ , by what distance will the free end of the string move up.