



IMPORTANT QUESTIONS FOR SECTION B: (NUMERICALS)

3 Marks for each question

MARKS DISTRIBUTION:

DATA GIVEN=0.5 MARK

DATA REQUIRED=0.5 MARK

FORMULA(E)=0.5 MARK

CALCULATION=1 MARK

UNIT=0.5 MARK

1. The focal length of a concave mirror is **10cm**. where should an object be placed so as to get its, real image magnified twice. **[15 cm]**
2. The radius of curvature of a concave mirror is **40cm**. where should an object be placed so as to get its, real image magnified four times. **[25 cm]**
3. The speed of light in water is **$2.25 \times 10^5 \text{ km/s}$** . What is the index of refraction in water **[1.33]**
4. Light travels from air into water whose index of refraction is **1.33**. If the angle of incidence is **40°** What is the angle of refraction? **[28.90°]**
5. The mass of ${}^6\text{C}^{12}$ nucleus is found to be 0.164×10^{-27} kg less than its constituents. Calculate the energy released. **[$1.476 \times 10^{-11} \text{ J}$]**
6. How much energy will be released when 15gm of mass is completely transformed to energy? **[$1.35 \times 10^{15} \text{ J}$]**
7. The wave length of a wave is 0.1 nm. Its speed is $3 \times 10^8 \text{ ms}^{-1}$. What is the frequency of the wave? **[$3 \times 10^{18} \text{ Hz}$]**
8. A tuning fork vibrates 256 times each second and produces a wave 1.3m long. Calculate (a) the period and (b) the velocity of the wave. **[$3.9 \times 10^{-3} \text{ s}$, 332.8 m/s]**
9. A radio station broad casts an AM radio waves whose frequency is $1230 \times 10^3 \text{ Hz}$ and an FM radio wave whose frequency is $91.9 \times 10^6 \text{ Hz}$. Find the distance between adjacent crest in each wave. **[24390 cm , 326.44 cm]**
10. A sound wave of frequency 400 Hz and wavelength 3m passes through a certain medium. Calculate the velocity of the wave in the medium. **[1200 m/s]**
11. The potential difference applied to the terminals of a portable radio is 9.0 volts. Find the resistance of the radio if a current of 25 mA is flowing through it.