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(Numerical type Question)

Date 20/02/2026

SEM-VI Unit-03 paper-II

Important Question and its solution

Q① The temperature of the Sun is approximately 5800K. Find the wavelength at ~~with~~ which maximum radiation occurs?

Ans:- Wien's displacement law:-

$$\lambda_{max} T = 2.898 \times 10^{-3} \, mK$$

$$\lambda_{max} = \frac{2.898 \times 10^{-3}}{5800}$$

$$\lambda_{max} = 5.0 \times 10^{-7} \, m$$

$$\boxed{\lambda_{max} = 500 \, nm}$$ Ans:-

Q② If the temperature of a star becomes double, by what factor does it radiation increase?

Ans:- Using Stefan-Boltzmann law:-

$$E = \sigma T$$

If temperature becomes 2T.

$$E' = \sigma (2T)^4$$

$$E' = 16 \sigma T$$

$$\boxed{E' = 16E}$$

So Radiation increases 16 times.

Q③ Calculate the energy of a photon of frequency 6×10^{14} Hz.

Ans:- $\because$ $E = h\nu$

$$E = (6.626 \times 10^{-34}) \times (6 \times 10^{14})$$

$$E = 3.98 \times 10^{-19} \, J$$ Ans