

2019 Ph H1 Q15

Section: Particles and Waves

Topic: Forces on Charged Particles / Photoelectric Effect

Brief summary of the question

In photoelectric experiment, frequency varied, current measured. Identify correct $I - f$ graph.

Worked solution

Below threshold frequency f_{th} , no electrons emitted $I = 0$.

Above f_{th} , photons eject electrons. At constant irradiance, number of photons fixed I nearly constant above f_{th} .

Graph: zero until f_{th} , then horizontal line.

Final answer

E — correct graph shape.

Revision tips

- Frequency affects energy per photon, not number per second (at fixed irradiance).
- Threshold f_{th} work function just matched.
- Current number of electrons emitted per second.