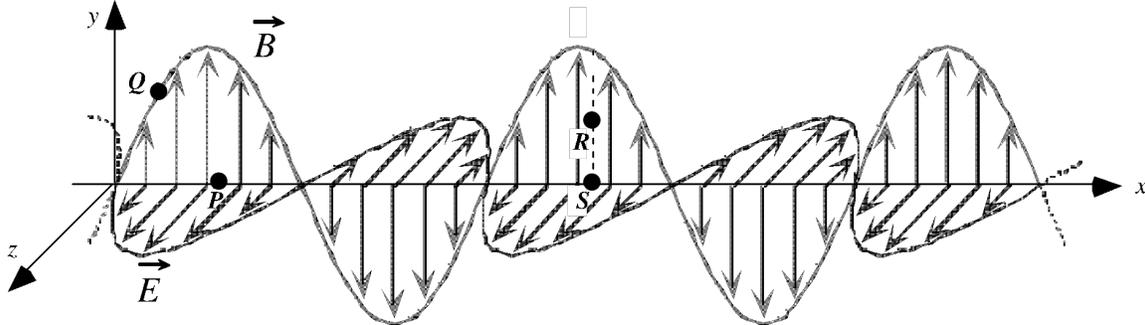


Shown below are mathematical and pictorial representations of an electromagnetic plane wave propagating through empty space. The electric field is parallel to the z -axis.

$$\vec{E}(x, y, z, t) = E_0 \sin(kx + \omega t) \hat{z}$$



The points R , and S in the diagram above lie in the x - y plane, the points P and Q also lie in the x - y plane. Each of the questions relates to the instant shown.

1. Which statement below correctly relates the magnitude of the *magnetic field* at points P and Q ? [3]

- a) $B_P > B_Q > 0$ b) $B_P > B_Q = 0$ c) $B_P = B_Q > 0$
 d) $B_P = B_Q = 0$ e) $B_Q > B_P > 0$ f) $B_Q > B_P = 0$

2. Explain your reasoning. [2]

3. Which statement below correctly relates the magnitude of the *magnetic field* at points S and R ? [3]

- a) $B_S > B_R > 0$ b) $B_S > B_R = 0$ c) $B_S = B_R > 0$
 d) $B_S = B_R = 0$ e) $B_R > B_S > 0$ f) $B_R > B_S = 0$

4. Explain your reasoning. [2]

