

Easy

Deputy Executive Engineer (Electrician) 2026

Sports Authority of Gujarat / Assistant Engineer (Electrical)

Consider the following statements regarding complex power: 1. Apparent power is the magnitude of complex power. 2. Reactive power can be negative. 3. Power factor

A**1 and 2 only****Correct****B****2 and 3 only****C****1 only****D****1, 2 and 3**

Correct Answer: A

Full Detailed Explanation

Correct Answer: A - 1 and 2 only Quick Concept Explanation In sinusoidal steady state, complex power combines real and reactive power as $S = P + jQ$. Power factor is the ratio $P/|S|$ and equals $\cos \phi$ for sinusoidal voltage and current. Key relation: $S = P + jQ$; $|S| = \sqrt{P^2 + Q^2}$; $PF = P/|S| = \cos \phi$. Exam focus: Draw the power triangle before choosing a power-factor relation. Common trap: Do not confuse P/Q with power factor. Statement-wise Verification Statement 1 - Correct. Apparent power is the magnitude of complex power. Its magnitude $|S|$ is apparent power in VA. Statement 2 - Correct. Reactive power can be negative. Inductive loads conventionally have positive Q and capacitive loads negative Q . Statement 3 - Incorrect. Power factor is defined as ratio of real power to reactive power. The correct principle is: Power factor is the ratio $P/|S|$ and equals $\cos \phi$ for sinusoidal voltage and current. Core Concept In sinusoidal steady state, complex power combines real and reactive power as $S = P + jQ$. Its magnitude $|S|$ is apparent power in VA, while P is measured in W and Q in var. Inductive loads conventionally have positive Q and capacitive loads negative Q . Power factor is the ratio $P/|S|$ and equals $\cos \phi$ for sinusoidal voltage and current. Formula / Key Relationship $S = P + jQ$; $|S| = \sqrt{P^2 + Q^2}$; $PF = P/|S| = \cos \phi$. Why the Other Options Are Wrong Option B is incorrect because it includes incorrect statement(s) 3