Hard | Deputy Executive Engineer (Electric | 2026 | orts Authority of Gujarat / Assistant Engineer (El

A parallel circuit consists of two branches: one with impedance (4 + j3) and another with (4 j3) connected to 100 V supply. Then 1. The total impedance

A 1, 2 and 4 only

B **1 and 4 only** Correct

C 2 and 3 only

D All of the above

Correct Answer: B

Full Detailed Explanation

Correct Answer: B - 1 and 4 only Quick Concept Explanation The equivalent resistance is not simply R; it is obtained after adding the two admittances. Complex-conjugate multiplication gives |4+j3| =25. Adding admittances cancels j3/25 exactly. Key relation: Yeq = 1/(4+j3)+1/(4 j3)=8/25=0.32 S; Zeq=1/Yeq=3.125 ; I=V/Zeq=32 A; PF=cos0 =1.Exam focus: For parallel complex branches, convert Z to Y first; it prevents sign and denominator mistakes. Common trap: Directly adding parallel impedances or assuming the equivalent resistance equals the real part of each branch. Statement-wise Verification Statement 1 - Correct.The total impedance is purely resistive.The imaginary parts cancel in admittance because the branch impedances are complex conjugates. Statement 2 - Incorrect.The equivalent impedance magnitude is 4 .The equivalent magnitude is 3.125 , not 4 . Statement 3 - Incorrect.Total current drawn is 25 A.I = 100/3.125 = 32 A, not 25 A. Statement 4 - Correct.Power factor of circuit is unity.Equivalent impedance is purely real, so the phase angle is zero and power factor is 1. Core Concept Parallel AC impedances should be combined through admittance. For conjugate branches R+jX and R jX, their susceptances cancel, leaving a real conductance. The equivalent resistance is not simply R; it is obtained after adding the two admittances. Formula / Key