

Hard Deputy Executive Engineer (Electricity) 2026 Gujarat Public Service Commission / Assistant Engineer (Electrical) 2026

$$\frac{1}{Z_{eq}} = \frac{1}{4-j3} + \frac{1}{4+j3}$$

A $\frac{1}{Z_{eq}} = \frac{1}{1-j2} + \frac{1}{1+j2}$

B $\frac{1}{Z_{eq}} = \frac{1}{1-j4} + \frac{1}{1+j4}$ Correct

C $\frac{1}{Z_{eq}} = \frac{1}{2-j3} + \frac{1}{2+j3}$

D $\frac{1}{Z_{eq}} = \frac{1}{2-j4} + \frac{1}{2+j4}$

Correct Answer: B

Full Detailed Explanation

Given circuit diagram is as follows:

For the given circuit diagram, the equivalent impedance is given by:

$$\frac{1}{Z_{eq}} = \frac{1}{4-j3} + \frac{1}{4+j3}$$

or

$$\frac{1}{Z_{eq}} = \frac{4+j3}{(4-j3)(4+j3)} + \frac{4-j3}{(4+j3)(4-j3)}$$

or

$$\frac{1}{Z_{eq}} = \frac{4+j3}{16-9j^2} + \frac{4-j3}{16-9j^2}$$

or

$$\frac{1}{Z_{eq}} = \frac{4+j3}{16+9} + \frac{4-j3}{16+9}$$

or

$$\frac{1}{Z_{eq}} = \frac{4+j3}{25} + \frac{4-j3}{25}$$

or

$$\frac{1}{Z_{eq}} = \frac{4+j3+4-j3}{25}$$

or

$$\frac{1}{Z_{eq}} = \frac{8}{25}$$

or

$$Z_{eq} = \frac{25}{8} = 3.125 \Omega$$

∴ $Y_{eq} = 1/Z_{eq} = 1/3.125 = 0.32 \text{ S}$

∴ $I = V/Z_{eq} = 32 \text{ A}$; $\cos \theta = 1$; $\therefore$ $P = VI \cos \theta = 32 \times 3.125 \times 1 = 100 \text{ W}$