

Easy

Deputy Executive Engineer (Electrician) 2026

Gujarat Public Service Commission / Assistant Engineer (Electrical)

Consider the following statements regarding magnetic circuits: 1. Magnetic reluctance represents the opposition offered by a material to the establishment of

A

1, 3 and 4 only

Correct

B

1 and 2 only

C

2 and 3 only

D

All of the above

Correct Answer: A

Full Detailed Explanation

Correct Answer: A - 1, 3 and 4 only
Quick Concept Explanation Magnetic circuits use an electric-circuit analogy: magnetomotive force drives magnetic flux through reluctance. An air gap greatly increases total reluctance because air has much lower permeability than iron. Key relation: $\Phi = \frac{MMF}{\Sigma R}$; $R = \frac{l}{\mu A}$; $F = NI$. Exam focus: Air gaps dominate reluctance even when physically short. Common trap: Permeability of magnetic materials is not generally constant with field intensity. Statement-wise Verification Statement 1 - Correct. Magnetic reluctance represents the opposition offered by a material to the establishment of magnetic flux, analogous to resistance in electric circuits. Magnetic circuits use an electric-circuit analogy: magnetomotive force drives magnetic flux through reluctance. Statement 2 - Incorrect. The permeability of a material is a constant parameter and does not vary with magnetic field intensity. Ferromagnetic permeability changes with field level because the B-H relationship is nonlinear. Statement 3 - Correct. Introduction of an air gap in a magnetic circuit significantly increases the total reluctance due to low permeability of air. An air gap greatly increases total reluctance because air has much lower permeability than iron. Statement 4 - Correct. Magnetic flux in a magnetic circuit is analogous to electric current flowing in an electrical