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

An induction motor operates at a slip of 5% with a supply frequency of 50 Hz. 1. Rotor frequency is approximately 2.5 Hz. 2. Rotor current frequency becomes zero at synchronous

A 2 and 3 only

B 1 and 4 only

C **1, 2 and 3 only** Correct

D All of the above

Correct Answer: C

Full Detailed Explanation

Correct Answer: C - 1, 2 and 3 only Quick Concept Explanation Rotor-current frequency is proportional to slip: at standstill it equals supply frequency, and at synchronous speed it becomes zero. Rotor frequency fr=s f=0.05 50=2.5 Hz. At synchronous speed s=0, fr=0; at standstill s=1, fr=f. Key relation: s=(N_s N)/N_s; f_r=s f_s.Exam focus: Standstill: s=1; synchronous speed: s=0. Common trap: Rotor frequency is not independent of slip. Statement-wise Verification Statement 1 - Correct.Rotor frequency is approximately 2.5 Hz.Rotor frequency fr=s f=0.05 50=2.5 Hz. Statement 2 - Correct.Rotor current frequency becomes zero at synchronous speed.Rotor-current frequency is proportional to slip: at standstill it equals supply frequency, and at synchronous speed it becomes zero. Statement 3 - Correct.Rotor frequency equals supply frequency at standstill.Rotor-current frequency is proportional to slip: at standstill it equals supply frequency, and at synchronous speed it becomes zero. Statement 4 - Incorrect.Rotor frequency is independent of slip.The correct principle is: Rotor-current frequency is proportional to slip: at standstill it equals supply frequency, and at synchronous speed it becomes zero. Core Concept Slip measures the difference between synchronous speed and rotor speed. Rotor-current frequency is proportional to slip: at standstill it equals supply