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

Consider the following statements regarding the nuclear power plants: 1. A thermal reactor needs a moderator material. 2. In a nuclear reactor, multiplication

A 1, 2 and 3

B 2 and 3 only

C **1 and 2 only** Correct

D 1 and 3 only

Correct Answer: C

Full Detailed Explanation

Correct Answer: C - 1 and 2 only Quick Concept Explanation Thermal nuclear reactors slow neutrons with a moderator so fission remains effective in thermal-fuel systems. Because capital cost is high and fuel cost comparatively low, nuclear plants are generally operated as base-load, not peak-only, units. Key relation: k_eff=1 critical; >1 supercritical; <1 subcritical.Exam focus: Critical reactor means neutron population is steady. Common trap: Nuclear plants are not peak-load-only plants. Statement-wise Verification Statement 1 - Correct.A thermal reactor needs a moderator material.Thermal nuclear reactors slow neutrons with a moderator so fission remains effective in thermal-fuel systems. Statement 2 - Correct.In a nuclear reactor, multiplication factor is kept almost equal to one.Steady critical operation keeps multiplication factor k_eff close to 1. Statement 3 - Incorrect.Nuclear power plants are used as peak load plants only.Nuclear plants are generally operated as base-load units Core Concept Thermal nuclear reactors slow neutrons with a moderator so fission remains effective in thermal-fuel systems. Steady critical operation keeps multiplication factor k_eff close to 1. Because capital cost is high and fuel cost comparatively low, nuclear plants are generally operated as base-load, not peak-only, units. Formula / Key Relationship k_eff=1 critical; >1