

Moderate

Assistant Engineer (Electrical), Class

2025

Building Department

An isolated generator is connected to a turbine with its continuous maximum power of 20 MW, 50 Hz. Generator is connected with two loads of 8 MW, each operates at 50

A

40.75

B

48.75

C

49.75

Correct

D

50.25

Correct Answer: C

Full Detailed Explanation

Concept & Reasoning Five-percent droop corresponds to a 2.5 Hz frequency change for a 20 MW full-range power change, so the slope is $2.5/20 = 0.125$ Hz/MW. The machine is initially supplying $8+8=16$ MW and has only 4 MW continuous headroom to its 20 MW turbine limit. A 6 MW added demand exceeds that headroom by 2 MW. Applying the exam's droop/shortfall convention gives $f = 0.125 \times 2 = 0.25$ Hz and $f = 49.75$ Hz. In a real isolated system, a fully saturated prime mover requires load-frequency dependence or load shedding for a true steady-state balance; that practical nuance is not specified in the MCQ. How to Solve It in the Exam Convert % droop to Hz/MW first. Important Exam Point An isolated governor with droop does not restore frequency exactly to 50 Hz without secondary control. Editorial / Answer-Key Note The official GPSC final answer key revised the provisional outcome for this question from D to C. Related Revision Path This question sits in the revision path Power System Load Frequency Control Governor Droop.