

Easy

Deputy Executive Engineer (Electricity) 2026

Uttar Pradesh Power Corporation Limited / Assistant Engineer (Electrical)

- A

1, 2, 3
- B

1, 3
- C

1, 2, 4

Correct
- D

Correct Answer: C

Full Detailed Explanation

1, 2, 3, 4

For a second order system, the damping ratio ζ and natural frequency ω_n are related to the system parameters k_p and k_d as follows:

$$\zeta = \frac{k_d}{2\sqrt{k_p}}$$
$$\omega_n = \sqrt{k_p}$$

Given $\zeta = 0.5$ and $\omega_n = 1$, we can find k_p and k_d :

$$0.5 = \frac{k_d}{2\sqrt{k_p}}$$
$$1 = \sqrt{k_p}$$

Solving these equations, we get $k_p = 1$ and $k_d = 1$.