PHY401A: Weekly Quizzes (Odd semester: 2022-23)

Total points: 5x10= 50 Date: Tuesday Time: 13h15-13h25

Quiz no. 9 (more than one answer may be correct)

41. For a heavily damped (overdamped) oscillator without any forcing,

(a) the kinetic energy decreases with time
(b) the potential energy decreases with time
(c) the total mechanical energy decreases with time
(d) the amplitude of the oscillation decreases with time

42. The resonance frequency of a weakly damped, forced oscillator is

(a) equal to that of an undamped, forced oscillator
(b) greater than that of an undamped forced oscillator
(c) less than that of an undamped forced oscillator
(d) not well defined at all

43. Keeping the other parameters unchanged, which of the following unforced oscillators would reach the equilibrium first?

(a) an undamped oscillator
(b) an underdamped oscillator
(c) a critically damped oscillator
(d) an overdamped oscillator

44. For a periodically forced and underdamped oscillator, the steady state solution

(a) is oscillatory
(b) may blow up for large times
(c) does not come from the complementary function
(d) corresponds to a resonance condition with finite amplitude

people with (a), (c) will also be given full marks.

45. In parametric instability

(a) some or all the parameters become function of time
(b) the total energy is still conserved (in general case)
(c) the form of the Lagrangian remains the same
(d) there is no integral of motion

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