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

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

Quiz no. 8 (more than one answer may be correct)

36. A particle of unit mass (in a specific unit) is moving under an attractive Kepler potential $V(r) = -0.7/r$. If the magnitude of the LRL vector, in the same unit, is given by $\sqrt{2}$, what would be the nature of trajectory of the particle?

(a) ellipse (but not a circle)
(b) circle
(c) parabola
(d) hyperbola

37. Which of the following can be possible unit(s) for an LRL vector?

(a) $N.kg.m^2$
(b) $J.kg^{-1}.m$
(c) $J^2.m^{-2}$
(d) $J^2.m.s^2$

38. A particle of mass 2 units is moving under a potential $U = 0.5/r + 3r^2$. What will be the angular frequency of the small oscillation about the position of unstable equilibrium?

(a) 1.732
(b) 0.707
(c) 3
(d) 1

39. A complex amplitude

(a) may be an explicit function of time
(b) needs to be constant in time
(c) includes the initial phase
(d) does not depend on the initial conditions

(b, c is also correct).

40. For an undamped forced oscillation

(a) the total mechnaical energy is conserved
(b) the amplitude shoots up to infinity at resonance
(c) the resonance occurs when the periodic force frequency is exatly equal to the natural frequency
(d) the displacement and the force are always in phase (with no phase difference)

No Rough Work is Allowed on this Page