A

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

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

Quiz no. 7 (more than one answer may be correct)

31. According to Bertrand's theorem,

(a) all the central potentials assure closed orbits
(b) some central potentials assure closed orbits
(c) some central potentials assure closed orbits for bounded motions
(d) some central potentials assure the falling of the particle to the centre

32. The total mechanical energy of a comet

(a) is always positive
(b) is always negative
(c) is always zero
(d) may be positive, negative or zero

33. For a parabolic orbit in Kepler's problem, which of the following is(are) NOT possible?

(a) the total mechanical energy may be twice the total agular momentum (in magnitude)
(b) the effective potential energy may be equal to the effective kinetic energy
(c) in effective 1d motion, there is one turning point at finite distance
(d) the particle always moves in one plane

34. Which of the following statement(s) is(are) true for Kepler's second law ?

(a) It is valid for all central potentials
(b) It is valid only for attractive central potentials
(c) It is equivalent the conservation of mechanical energy
(d) It is valid even if there is no closed orbit

35. How many cyclic coordinates are there in the Lagrangian of a particle moving under a central potential?

(a) 0
(b) 1
(c) 2
(d) 3

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