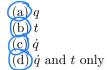
## PHY401A: Weekly Quizzes (Odd semester: 2022-23)

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

## Quiz no. 3 (more than one answer may be correct)

11. A Lagrangian can be a function of



- 12. Lagrangian of a mechanical system is given by T-V when
  - (a) the system is conservative
  - (b) the system is subject to a periodic external force
  - (c) the system has kinetic energy which is a quadratic function of generalized velocities
  - (d) the Lagrangian is positive definite for all generalized coordinates and velocities
- 13. If the kinetic energy of a mechanical system is independent of the generalized coordinates, then the Lagrangian
  - (a) will no longer satisfy the Euler-Lagrange equation
  - (b) is a constant of motion
  - (c) can be an explicit function of time
  - (d) may sometimes represent a conservative system
- 14. If the Lagrangian of a particle is given by  $L = q^2 \dot{q}^2 t^2$ , the particle moves with
  - (a) constant acceleration
  - (b) periodic velocity
  - (c) uniform velocity
  - (d) constant angular momentum
- 15. A particle of unit mass is moving in a plane  $(r, \theta)$ . If the generalized momentum  $p_r$  is always equal to  $p_{\theta}$ , in  $r \theta$  plot, the particle trajectory is given by a
  - (a) circle
  - (b) cycloid
  - (c) parabola
  - (d) none of these