

13. Continuous string as (c) $2n$ variables /
a limiting case of
weighted string

14. Equipartition energy (d) $h^{3.5}$

15. Phase space (e) $\frac{1}{2}kT$

Answer in 1 or 2 sentences :

16. What is the nature of Poisson bracket of two constants of motion?

17. What is the expression for the rotational kinetic energy of a rigid body?

18. What is the frequency of parallel pendula, if the pendula are out of phase with each other?

19. What is the relation for entropy through partition function?

20. Give two examples for which we can apply BE statistics.

SECTION B — (5 × 6 = 30 marks)

Answer ALL questions.

21. (a) Show that $[l_x, p_x] = \frac{\partial l_x}{\partial x} = 0$.

Or

(b) Obtain HJ equation for Hamiltonian's characteristic function W . Give the physical meaning of W .

22. (a) Obtain the matrices B , C and D for the three rotations of the rigid body using Euler's angles.

Or

(b) Deduce equation of motion of a rigid body.

23. (a) Distinguish between stable and unstable equilibrium.

Or

(b) Give the formulation of the problem of small oscillations with Lagrange equation.

24. (a) Deduce an expression for equipartition energy.

Or

(b) Discuss the limitations and applicability of MB statistics.