

6. a) Discuss harmonic oscillator as an example of canonical transformation. [6]
b) Prove that the transformation $P = \frac{1}{2}(p^2 + q^2)$, $Q = \tan^{-1}(q/p)$ is canonical. [3]
7. a) Calculate the frequency of linear harmonic oscillator by using method of action angle variable. [4]
b) Using method of small oscillation, calculate the frequency of two coupled oscillator. [5]
8. Write short notes on (any **Three**):- [3x3]
a) Geodesics of a sphere
b) Poisson Bracket
c) Stability of orbits
d) Generating Function
e) Action angle variable
f) Variation Principle