



## SECTION-B

2. What is spherical polar coordinate system? What are the limits of  $r$ ,  $\theta$ ,  $\phi$ ? Derive the relationship between spherical polar coordinates and three dimensional cartesian coordinates.
3. State and prove Kepler's laws of planetary motion using the concept of reduced mass.
4. Describe Michelson-Morley experiment. What do you conclude from Michelson- Morley experiment? If ether does not exist, in what medium does light travel?
5. Discuss the effect of Coriolis force due to rotation of the earth on the setting up of cyclones, trade winds and describe other geographical effects of this force. Cyclones do not occur at equator. Explain.
6. Discuss relativistic Doppler effect and derive relations for longitudinal and transverse Doppler effect. What is meant by the terms red shift and blue shift?
7. Establish mathematically Einstein's mass energy relationship. Explain physical significance of this relation. Mention two nuclear phenomena supporting this relation.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**