

Answers to selected questions

Chapter 20

- Q6** No. The direction of the velocities of the plane and the air are perpendicular. The speed of the plane relative to the ground will equal the vector sum of velocity of the air and the velocity of the plane.
- Q12** The second postulate is at variance with the classical rule for adding velocities since the classical prescription would allow the velocity of light to take on different values depending on the motion of an observer.
- Q18** If the father takes up space travel and travels close to the speed of light, he could return and find himself to have aged at a slower rate than his child.
- Q24** Since mass is energy this statement is not correct. We should state that energy in one form, rest mass, is converted into another form of energy, kinetic energy.
- Q30** A black hole is a very small region in space having an enormous mass. A black hole is believed to be the end result of an extremely massive star collapsed into the small region. There are also supermassive black holes within galaxies, which might have formed from early collisions between primordial galaxies.