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The accuracy of scientific observations and calculations is always at the mercy of the scientists timekeeping methods. For this reason, scientists are interested in devices that give promise of more precise timekeeping. In their search for precision, scientists have turned to atomic clocks that depend on various vibrating atoms or molecules to supply their "ticking". This is possible because each kind of atom or molecule has its own characteristic rate of vibration. The nitrogen atom in ammonia, for example, vibrates or "ticks" 24 billion times a second. One such atomic clock is so accurate that it will probably lose no more than a second in 3000 years. It will be of great importance in fields such as astronomical is a cesium atom that vibrates 9.2 billion times a second when heated to the temperature of boiling water. An atomic clock that operates with an ammonia molecule may be used to check the accuracy of predictions based on Einstein's relativity theories, according to which a clock in motion and a clock at rest should keep time differently. Placed in an orbiting satellite moving at a speed of 18000 miles an hour, the clock could broadcast its time readings to a ground station, where they would be compared with the readings on a similar model. Whatever differences develop would be checked against the differences predicted.

1. Scientists expect that the atomic clocks will be \_\_\_\_\_.  
a. more precise  
b. absolutely accurate  
c. more durable  
d. indestructible

2. The heart of the

atomichron is \_\_\_\_\_.a.acesium atomb.an ammonia moleculec.a nitrogen atomd.a hydrogen3.From the0selection,we may assume that temperature changes\_\_\_\_\_.a.affect only ammonia moleculesb.may affect the vibration rate of atomsc.affect the speed at which atoms traveld.do not affect atoms in any way4.Identical atomic clocks may be used to check\_\_\_\_\_.a.the effect of outer space on an atomic clockb.the actual speed of an orbiting satellitesc.the accuacy of predictions based on theories of relativityd.all of Einsteins theories5.Implied but not stated:\_\_\_\_\_.a.Precise timekeeping is essential in scienceb.Scientists expect to disprove Einsteins relativity theoriesc.Atomic clocks will be important in space flightd.The rate of vibration of an atom never varies24/200

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