

**12** A certain star of mass  $M$  and radius  $r$  rotates so rapidly that material at its equator only just remains on its surface. Given that the gravitational constant is  $G$ , the period of rotation is

**A**  $2\pi\sqrt{\frac{r}{G}}$

**B**  $2\pi\sqrt{\frac{G}{r}}$

**C**  $2\pi\sqrt{\frac{r}{MG}}$

**D**  $2\pi\sqrt{\frac{r^3}{MG}}$