

Sample questions – PHYSICS

Questions for JEST – 2010 will cover the BSc and MSc syllabus. A few sample questions are given below.

- 1) An n -dimensional traceless tensor T_{ijk}^k is symmetric with respect to the indices i and j . The maximum number of independent components of the tensor is
 - (a) $n^3/2$
 - (b) $n(n+1)/2$
 - (c) $(n-1)(n+2)/2$
 - (d) $n^2(n-1)/2$

- 2) A particle bounces freely back and forth along the x -axis between impenetrable walls located at $x=-1$ and $x=a$. The potential energy equals zero for $|x|<a$. If the energy of the particle is $1/3$ eV when it is in its lowest energy state, what is the energy when it is in its second excited state?
 - (a) 3 eV
 - (b) $4/3$ eV
 - (c) $1/3$ eV
 - (d) 1 eV

- 3) Which component of the nuclear liquid-drop model potential prevents a stable nucleus from undergoing spontaneous fission?
 - (a) Attractive volume term.
 - (b) Surface term reducing the nuclear binding energy.
 - (c) Coulomb term reducing the nuclear binding energy.
 - (d) Asymmetry term reducing the binding energy of an asymmetric nucleus.