

| Question number | Answer  | Mark     |
|-----------------|---|----------|
| 13(a)           | <ul style="list-style-type: none"> <li>Mass of products is less than mass of antineutron<br/><b>Or</b> particles have kinetic energy after decay 1</li> <li>Where mass difference and the kinetic energy are related by<br/><math>\Delta E = c^2 \Delta m</math> 1</li> </ul>   | (2)      |
| 13(b)           | <ul style="list-style-type: none"> <li>Conservation of charge (because same before and after) 1</li> <li>Antineutron charge = 0;<br/>charge of antiproton = -1, positron = 1, neutrino = 0;<br/>total charge after = 0 1</li> <li>Conservation of baryon number (because same before and after) 1</li> <li>Antineutron baryon number = -1;<br/>Antiproton baryon number = -1, positron = 0, neutrino = 0<br/>Total baryon number after = -1 1</li> <li>Conservation of lepton number (because same before and after) 1</li> <li>Antineutron lepton number = 0;<br/>Antiproton lepton number = 0, positron = -1, neutrino = 1<br/>Total lepton number after = 0 1</li> </ul> | (6)      |
|                 | <b>Total for Question 13</b>  | <b>8</b> |