RADIOACTIVITY

1. B
2. A
3. A
4. D
5.
   (a) 0 and -1 for B; 234 and 91 for Pa; 2
   (b) An explanation to include:
       1. gamma ray a wave; 2
       2. no mass/protons; 2

[4]

6.
   (a) gamma; 1
   (b) (i) beta; 1
       (ii) An explanation to include:
           1. alpha would not penetrate/alpha all absorbed/alpha stopped by paper/eq; 2
           2. all gamma would penetrate (too much)/gamma not absorbed; [Accept alpha not strong enough and gamma is too strong/eq for 1 max] 2

[4]

7.
   (a) paper stops f\_\text{C1}
   sheet of paper makes no difference to count rate A1
   (b) Aluminium absorbs f\_\text{A} allow aluminium stops f\_\text{A} C1
   Aluminium makes count rate decrease A1
   (c) (10mm) lead / Pb stops all f\_\text{A} OR only f\_\text{A} gets through (10 mm) lead / Pb B1
   still some count rate with lead / Pb B1 [6]