Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

(a) has an equal amount of positive charge
accept pudding/it is positive
1

(b) (experimental) results could not be explained using 'plum pudding' model
or
(experimental) results did not support plum pudding model
accept (experimental) results disproved plum pudding model
1

(c) (i) **A** – most of atom is empty space**or**most of atom concentrated at the centre
1

B – nucleus is positive (so repels alpha particles)
accept nucleus has the same charge as alpha
1

C – nucleus is very small
accept nucleus is positive if not scored for B
or
nucleus is a concentrated mass
accept nucleus has a very concentrated charge
1

(ii) (if predictions correct, this) supports the new model
answers should be in terms of the nuclear model
accept supports his/new/nuclear theory
accept proves for supports
accept shows predictions/ Rutherford was correct
1

[6]

Q2.

(a) cobalt-(60)
1

gamma (radiation) will pass through food / packaging
this can score if technetium chosen
1

long half-life so level of radiation (fairly) constant for (a number) of years
this can score if strontium / caesium is chosen

accept long half-life so source does not need frequent replacement
accept answers in terms of why alpha and beta cannot be used
gamma kills bacteria is insufficient

1

(b) (i) people may link the use of radiation with illness / cancer
accept (they think) food becomes radioactive
accept (they think) it is harmful to them
'it' refers to irradiated food

1

(ii) not biased / influenced (by government views)

1

(iii) any **two** from:

- data refers only to (cooked) chicken
- data may not generalise to other foods
- the content of some vitamins increases when food / chicken is irradiated
- no vitamins are (completely) destroyed
- (only) two vitamins decrease (but not significantly)
accept irradiated chicken / food contains a higher level of vitamins
marks are for the explanation only

2

(iv) so can choose to eat / not eat that (particular) food
accept irradiated food may cause health problems (for some people)
accept people may have ethical issues (over eating irradiated food)

1

(c) (i) electron
from nucleus / neutron
***both** parts required*

1

(ii) 90 years
*allow **1** mark for showing 3 half-lives*

2

[11]