

Name of the Student: _____

Max. Marks : 20 Marks

Time : 20 Minutes

Mark Schemes

Q1.

- (a) two from:
internal/bodies
thoron
building materials
soil
food
rocks
radon
gamma rays
cosmic rays/outer space
any 2 for 1 mark each
2
- (b) only a very small amount of the background
radioactivity comes from nuclear power owtte.
accept any sensible response for 1 mark
1
- (c) use G.M. tube/meter/counter or film
'count' higher than or compare with background/normal/control or film is blacker
for 1 mark each
2
- (d) more neutrons/different number
gains 1 mark

but I-131 has 4 extra neutrons = 2
or I-131 has 78 neutrons I-127 has 74 (2)
gains 2 marks
2
- (e) (i) emits radiation
ionises
molecules
in cells
radiation damages cells/mutation/kills cells
may cause cancer
 β / γ / radiation is penetrating
half-life is long enough for damage to be caused
any 4 for 1 mark each (4 from above)
4
- (ii) e.g. replace I-127 in body/body cannot tell the difference/causes thyroid
cancer/causes cancer (but not if already given in (i))

for 1 mark

1

(iii) **Either** No

half-life = 8 days many half lives have passed/attempts to calculate number of half-lives **or** explains meaning of half-life so very little left/become harmless

for 1 mark each

or Yes half-life = 8 days such a large quantity was released although little left it is still harmful

for 1 mark each

3

[15]

Q2.

(a) 1, 0

X, -1 (X = negligible / very small / (1/1840) to (1/2000), but not nothing

2 for 4 correct

1 for 2/3 correct

2

(b) has a nucleus which is positive charge

negative charges (electrons) orbit nucleus

each for 1 mark

3

[5]