This print-out should have 18 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering. The due time is Central time.

Holt da 22 rev 44d

33:01, highSchool, numeric, < 1 min, fixed.

001

What is the neutron : proton ratio for the nucleus $^{156}_{60}$Nd, and where does it lie in relation to the band of stability?

1. 2 : 1, outside

2. 1 : 1, outside

3. 1 : 2, outside

4. 1.6 : 1, outside

5. 2 : 1, within

6. 1 : 1, within

7. 1 : 2, within

8. 1.6 : 1, within

9. None of these

Mlib 11 6123

33:01, basic, multiple choice, > 1 min, fixed.

002

Of the following species, the one with the greatest energy is probably

1. a proton.

2. an α particle.

3. a β particle.

4. an electron.

5. a γ ray.

Mlib 11 6125

33:01, basic, multiple choice, > 1 min, fixed.

003

What species has the greatest mass?

1. a γ ray.

2. a proton.

3. a β particle.

4. an electron.

5. an α particle.

Murray chp 7 ratio 2

33:01, basic, multiple choice, < 1 min, fixed.

004

What is the neutron : proton ratio for the nucleus $^{3}_{1}$H?

1. 2 : 1

2. 3 : 1

3. 1 : 2

4. 1 : 3

5. 1 : 1

6. None of these

Mlib 11 6127

33:01, basic, multiple choice, > 1 min, fixed.

005

What species carries a negative charge?

1. γ rays

2. α particle

3. β particle

4. protons

Mlib 11 6033

33:03, basic, multiple choice, > 1 min, fixed.

006

$^{10}_{4}$Be undergoes radioactive decay to form $^{10}_{5}$B. This is an example of

1. γ ray emission.

2. electrolysis.

3. α particle emission.

4. β particle emission.

Mlib 68 0111

33:03, basic, multiple choice, > 1 min, fixed.

007

Of what are α, β, and γ radiation comprised (in that order)?

1. He nuclei; high energy electrons; electromagnetic radiation

2. high energy electrons; He nuclei; electromagnetic radiation

3. electromagnetic radiation; He nuclei; high energy electrons

4. He nuclei; high energy positrons; electromagnetic radiation high energy electrons

5. high energy electrons; electromagnetic radiation; He nuclei

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Mlib 72 1008 rev

33:03, basic, multiple choice, < 1 min, fixed.

008

In the radioactive decay of ^{204}Pb to ^{200}Hg the other product is

1. a neutron.

2. an electron.

3. an α particle.

4. ^{4}Be.

5. a proton.

Mlib 11 6011

33:03, basic, multiple choice, > 1 min, fixed.

009

When a radioactive atom emits an α particle, its mass number

1. increases by two.

2. decreases by two.

3. increases by four.

4. decreases by four.

Mlib 72 1008

33:03, basic, multiple choice, > 1 min, fixed.

010

In the radioactive decay of ^{204}Pb to ^{200}Hg the other product is

1. a neutron.

2. an electron.

3. an α particle.

4. a γ particle.

5. a positron.

Mlib 76 0106

33:03, basic, multiple choice, > 1 min, fixed.

011

$^{214}_{83}$Bi decays by beta emission. The product is

1. $^{214}_{84}$Po .

2. $^{214}_{84}$Bi .

3. $^{210}_{82}$Pb .

4. $^{212}_{79}$Au .

Nuclear

33:03, basic, multiple choice, < 1 min, fixed.

012

How does a nuclear reaction differ from a chemical reaction?

1. In a nuclear reaction the elements change identities; in an ordinary chemical reaction they do not.

2. In a chemical reaction elements are created and destroyed while all elements are conserved in a nuclear reaction.

3. Entropy is increased in a nuclear reaction while entropy decreases in a chemical reaction.

4. Entropy is increased in a chemical reaction while it is decreased in a nuclear reaction.

5. There is no actual difference in the two reactions. The only difference is that a nuclear reaction emits radiation while a chemical reaction emits heat.

Sparks nuc 07

33:03, basic, multiple choice, < 1 min, fixed.

013

O-15 decays by positron emission. What is the product of this decay?

1. $^{11}_{6}\mathrm{C}$

2. $^{15}_{7}\mathrm{N}$

3. $^{15}_{9}\mathrm{F}$

4. $^{14}_{8}\mathrm{O}$

5. $^{15}_{10}\mathrm{Ne}$

6. None of these

Sparks nuc 09

33:03, basic, multiple choice, < 1 min, fixed.

014

$^{99}_{42}\mathrm{Mo}$ decays by beta emission. What is the product?

1. $^{99}_{41}\mathrm{Nb}$

2. $^{99}_{44}\mathrm{Ru}$

3. $^{95}_{40}\mathrm{Zr}$

4. $^{99}_{43}\mathrm{Tc}$

5. $^{98}_{42}\mathrm{Mo}$

6. None of these

Holt da 22 1 rev 4b

33:04, highSchool, numeric, < 1 min, fixed.

015

Complete and balance the nuclear equation $^{9}_{4}\mathrm{Be} + {}^{4}_{2}\mathrm{He} \longrightarrow \underline{\ ?\ } + {}^{1}_{0}n\,.$

1. $? = {}^{12}_{6}\mathrm{C}$

2. $? = {}^{13}_{6}\mathrm{C}$

3. $? = {}^{4}_{2}\mathrm{He}$

4. $? = {}^{1}_{1}\mathrm{H}$

5. $? = {}^{5}_{2}\mathrm{He}$

6. $? = {}^{1}_{0}n$

7. None of these

Holt da 22 2 practice 3

33:06, highSchool, numeric, < 1 min, fixed.

016

The half-life of radon-222 is 3.824 days. After what time will one-fourth of a given amount of radon-222 remain?

1. 1.912 days

2. 3.824 days

3. 4.736 days

4. 7.648 days

5. 9.560 days

6. 11.472 days

7. 13.384 days

8. 15.296 days

9. 17.208 days

10. None of these

Holt da 22 2 practice 6

33:06, highSchool, numeric, < 1 min, fixed.

017

The half-life of polonium-218 is 3 min. If you start with 16 mg, how long will it be before only 1.0 mg remains?

1. 1.5 min

2. 3.0 min

3. 4.5 min

4. 6.0 min

5. 7.5 min

6. 9.0 min

7. 10.5 min

8. 12.0 min

9. 13.5 min

10. None of these

Sparks nuc 17

33:05, basic, multiple choice, < 1 min, fixed.

018

Which is NOT a unit used to measure radiation?

1. Ci

2. Sv

3. rem

4. Rz

5. rad