ENGLAND GCSE PHYSICS OCR TWENTY FIRST CENTURY FOUNDATION · UNIT 5 · 25 QUESTIONS

Radioactive Materials — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **A thermometer is placed in hot water. What happens to the liquid inside the thermometer?**

- A it expands
- B it freezes
- C it contracts
- D it evaporates

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2 **Glass marbles are used to model atoms. What is a limitation of the model?**

A marbles are the wrong colour for atoms

B marbles are much bigger than atoms

C marbles are too small to see properly

D marbles cannot be counted accurately at all

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3 **A swimming pool holds water. Why does a person float in the pool?**

A their density is close to water

B they are made of air

C the water pushes them down

D they are heavier than water and sink

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4 **A hot air balloon rises because the air inside it is less dense than the air outside. What happens to the density of air when it is heated?**

- A it increases
- B it becomes zero
- C it stays the same
- D it decreases

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5 **Hardcover books are dropped. What happens to their speed as they fall?**

- A it decreases
- B it increases
- C it stays the same
- D it becomes zero

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6 **A cup of coffee is left for an hour. What happens to its temperature?**

A it falls to room temperature

B it stays the same all day

C it falls to zero degrees

D it rises above room temperature

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7 **In beta decay, what happens to the mass number of the nucleus?**

A it rises by 1, like the atomic number

B it stays the same

C it falls by 1, like a proton

D it falls by 4, like in alpha decay

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8 **An atom has a mass number of 12 and an atomic number of 6. How many neutrons does it have?**

A 5

B 8

C 6

D 7

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9 **Why is contamination by a radioactive source more dangerous than irradiation?**

A it keeps irradiating from inside

B the source stops working at once, so it is safe

C contamination cannot be measured

D irradiation is always fatal

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10 **Why is a short half-life source chosen for a medical tracer?**

- **A** so it can be reused
- **B** so it stays in the body for years
- **C** it decays quickly
- **D** so it is cheaper to make

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11 **A sample has an activity of 800 counts per minute. After 2 half-lives, what is its activity?**

- **A** 400
- **B** 100
- **C** 200
- **D** 800

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12 **Which releases more energy per kilogram of fuel, fission or fusion?**

A fusion

B neither releases energy

C they release the same

D fission

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13 **Why is nuclear fission used to generate electricity?**

A it works without any fuel at all, for ever

B lots of energy from little fuel

C it produces no waste at all

D it needs no shielding

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14 **What is contamination?**

A radioactive material on a surface

B a type of decay that is dangerous

C exposure to radiation from a source

D a type of fission that is uncontrolled

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15 **A sample has a half-life of 5 days. What percentage of the sample is left after 10 days?**

A 50%

B 12%

C 25%

D 75%

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16 **A sample's activity halves every 10 years. After 20 years, what fraction of the original activity remains?**

- A 1
- B 1/8
- C 1/4
- D 1/2

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17 **A radioactive sample has an activity of 800 Bq. What is its activity after 2 half-lives?**

- A 800 Bq
- B 200 Bq
- C 100 Bq
- D 400 Bq

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18 **A sample has a half-life of 5 days. After 15 days, what fraction remains?**

- A 1/4
- B 1/8
- C 1/16
- D 1/2

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19 **A nucleus gives out a beta particle. What is the beta particle?**

- A a fast electron
- B two protons and two neutrons
- C one proton
- D pure energy

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20 **An atom has a mass number of 23 and an atomic number of 11. How many neutrons does it have?**

- A 11
- B 14
- C 12
- D 13

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21 **Why is americium-241 used in smoke alarms?**

- A it glows when there is smoke
- B it makes a loud sound when it sees smoke
- C smoke stops its alpha particles
- D it detects heat

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22 **A sample has an activity of 3200 counts per minute. After 3 half-lives, what is its activity?**

- A 400
- B 1600
- C 200
- D 800

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23 **What is nuclear fusion?**

- A two light nuclei join together
- B a nucleus breaking into protons
- C an atom losing electrons
- D a heavy nucleus splitting in two

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24 **What is released when a uranium nucleus splits?**

A heat and oxygen

B light and sound only

C protons and electrons

D energy and neutrons

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25 **Where does fusion happen naturally?**

A in a power station

B in the Sun

C in the Moon

D in the Earth

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ANSWER KEY

1.	A	**10.**	C	**19.**	A
2.	B	**11.**	C	**20.**	C
3.	A	**12.**	A	**21.**	C
4.	D	**13.**	B	**22.**	A
5.	B	**14.**	A	**23.**	A
6.	A	**15.**	C	**24.**	D
7.	B	**16.**	C	**25.**	B
8.	C	**17.**	B		
9.	A	**18.**	B		

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