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IGCSE PHYSICS 0625 · TOPICAL PAST PAPERS

# The Nuclear Model of the Atom

Paper 1 — Multiple-Choice Questions (topical compilation)

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# The Nuclear Atom

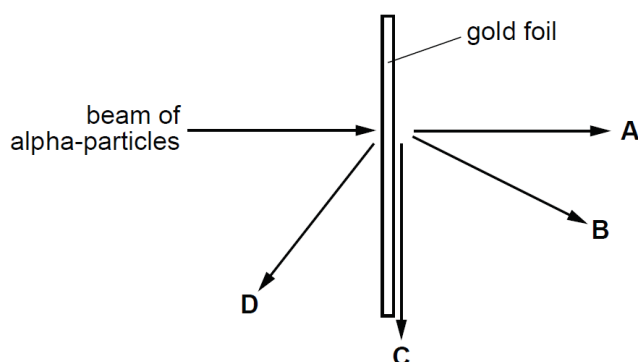
## PAPER 1 QUESTIONS

### Atomic model

#### QUESTION # 1: O/N 17 P11

37 A narrow beam of alpha-particles is fired at a thin piece of gold foil.

What is the final direction of the largest number of alpha-particles?



#### QUESTION # 2: O/N 18 P11

38 The results of the alpha-particle scattering experiment gave evidence for which of the following?

- A nuclear fusion
- B radioactive decay
- C the existence of isotopes
- D the nuclear atom

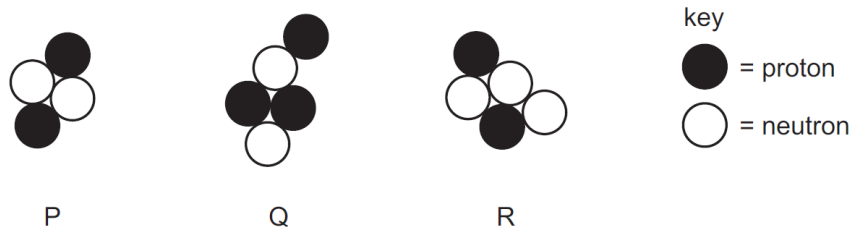
## Nucleus

### QUESTION # 1: M/J 16 P11

- 40 Which statement about a nucleus of  $^{15}_7\text{N}$  is correct?
- A The nucleus contains 7 neutrons and 8 protons.
  - B The nucleus contains 7 neutrons and 15 protons.
  - C The nucleus contains 7 protons and 8 neutrons.
  - D The nucleus contains 7 protons and 15 neutrons.

### QUESTION # 2: M/J 16 P12

- 40 The diagrams represent the nuclei of three atoms.



Which are isotopes of the same element?

- A P and Q only
- B P and R only
- C Q and R only
- D P, Q and R

### QUESTION # 3: M/J 18 P11

- 39 How many nucleons are in one neutral atom of the krypton isotope  $^{84}_{36}\text{Kr}$ ?
- A 36
  - B 48
  - C 84
  - D 120

**QUESTION # 4: M/J 18 P11**

40 A radioactive nucleus is represented as  ${}_{92}^{230}\text{U}$ .

Which row represents another isotope of the same element?

|   | number of<br>protons in nucleus | number of<br>neutrons in nucleus |
|---|---------------------------------|----------------------------------|
| A | 90                              | 140                              |
| B | 91                              | 138                              |
| C | 92                              | 139                              |
| D | 93                              | 136                              |

**QUESTION # 5: M/J 19 P11**

40 A neutral atom of boron contains 5 electrons and 5 protons.

The nucleon number (mass number) of the atom is 11.

How many neutrons are there in the atom?

- A 1                      B 5                      C 6                      D 11

**QUESTION # 6: M/J 20 P11**

37 The nuclide notation for an isotope of X is  ${}_Z^AX$ .

How many neutrons are there in a nucleus?

- A A                      B A – Z                      C Z – A                      D Z

**QUESTION # 7: O/N 16 P11**

40 Which number is always equal to the proton number of a neutral atom of a radioactive isotope?

- A the number of electrons in the atom  
B the number of neutrons in the atom  
C the number of nucleons in the atom  
D the number of particles in the atom

**QUESTION # 8: O/N 17 P11**

**39** How does a nucleus of the isotope chlorine-37 differ from a nucleus of the isotope chlorine-35?

- A** It contains one more neutron and one more electron.
- B** It contains one more proton and one more electron.
- C** It contains two more neutrons.
- D** It contains two more protons.

**QUESTION # 9: O/N 18 P11**

**40** One nucleus of a uranium isotope contains 238 nucleons of which 146 are neutrons.

Which is the nucleus of another isotope of uranium?

|          | number of nucleons<br>in the nucleus | number of neutrons<br>in the nucleus |
|----------|--------------------------------------|--------------------------------------|
| <b>A</b> | 235                                  | 143                                  |
| <b>B</b> | 237                                  | 147                                  |
| <b>C</b> | 238                                  | 144                                  |
| <b>D</b> | 241                                  | 146                                  |

**QUESTION # 10: O/N 18 P12**

**40** Which statement about two different isotopes of the same element is correct?

- A** Both isotopes have the same number of electrons in a nucleus.
- B** Both isotopes have the same number of protons in a nucleus.
- C** Both isotopes have the same number of neutrons in a nucleus.
- D** Both isotopes have the same number of nucleons in a nucleus.

**QUESTION # 11: O/N 20 P12**

**40** Which row shows the atomic structure of a neutral atom with a nucleon number of 9?

|          | number of<br>neutrons | number of<br>protons | number of<br>electrons |
|----------|-----------------------|----------------------|------------------------|
| <b>A</b> | 4                     | 5                    | 4                      |
| <b>B</b> | 4                     | 5                    | 5                      |
| <b>C</b> | 5                     | 4                    | 5                      |
| <b>D</b> | 5                     | 5                    | 4                      |