

# Atoms

1. The first model of atom in 1898 was proposed by

- (a) Ernst Rutherford
- (b) Albert Einstein
- (c) J.J. Thomson
- (d) Niels Bohr

▼ **Answer**

Answer: c

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2. In Geiger-Marsden scattering experiment, the trajectory traced by an  $\alpha$ -particle depends on

- (a) number of collision
- (b) number of scattered  $\alpha$ -particles
- (c) impact parameter
- (d) none of these

▼ **Answer**

Answer: c



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3. In the Geiger-Marsden scattering experiment the number of scattered particles detected are maximum and minimum at the scattering angles respectively at

- (a)  $0^\circ$  and  $180^\circ$
- (b)  $180^\circ$  and  $0^\circ$
- (c)  $90^\circ$  and  $180^\circ$
- (d)  $45^\circ$  and  $90^\circ$

▼ **Answer**

Answer: a

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4. In the Geiger-Marsden scattering experiment, in case of head-on collision the impact parameter should be

- (a) maximum
- (b) minimum
- (c) infinite
- (d) zero

▼ **Answer**

Answer: a

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5. Rutherford's experiments suggested that the size of the nucleus is about

- (a)  $10^{-14}$  m to  $10^{-12}$  m
- (b)  $10^{-15}$  m to  $10^{-13}$  m
- (c)  $10^{-15}$  m to  $10^{-14}$  m
- (d)  $10^{-15}$  m to  $10^{-12}$  m

▼ **Answer**

Answer: c

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6. Which of the following spectral series falls within the visible range of electromagnetic radiation?

- (a) Lyman series
- (b) Balmer series
- (c) Paschen series
- (d) Pfund series

▼ **Answer**

Answer: b

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7. The first spectral series was discovered by

- (a) Balmer

- (b) Lyman
- (c) Paschen
- (d) Pfund

▼ Answer

Answer: a

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8. Which of the following postulates of the Bohr model led to the quantization of energy of the hydrogen atom?

- (a) The electron goes around the nucleus in circular orbits.
- (b) The angular momentum of the electron can only be an integral multiple of  $h/2\pi$ .
- (c) The magnitude of the linear momentum of the electron is quantized.
- (d) Quantization of energy is itself a postulate of the Bohr model.

▼ Answer

Answer: b

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9. The Bohr model of atoms

- (a) assumes that the angular momentum of electrons is quantized.
- (b) uses Einstein's photoelectric equation.
- (c) predicts continuous emission spectra for atoms.
- (d) predicts the same emission spectra for all types of atoms.

▼ Answer

Answer: a

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10. If  $n$  is the orbit number of the electron in a hydrogen atom, the correct statement among the following is

- (a) electron energy increases as  $n$  increases.
- (b) hydrogen emits infrared rays for the electron transition from  $n = 2$  to  $n = 1$
- (c) electron energy is zero for  $n = 1$  ( $< 0$  electron energy varies as  $n^2$ ).

▼ Answer

Answer: a

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11. If the radius of inner most electronic orbit of a hydrogen atom is  $5.3 \times 10^{-11}$  m, then the radii of  $n = 2$  orbits is

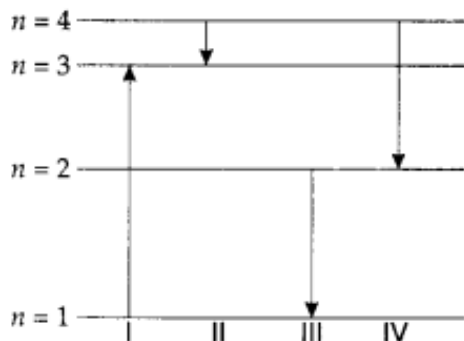
- (a)  $1.12 \text{ \AA}$
- (b)  $2.12 \text{ \AA}$
- (c)  $3.22 \text{ \AA}$
- (d)  $4.54 \text{ \AA}$



▼ Answer

Answer: b

12. The diagram shows the energy levels for an electron in a certain atom. Which transition shown represents the emission of a photon with the most energy?

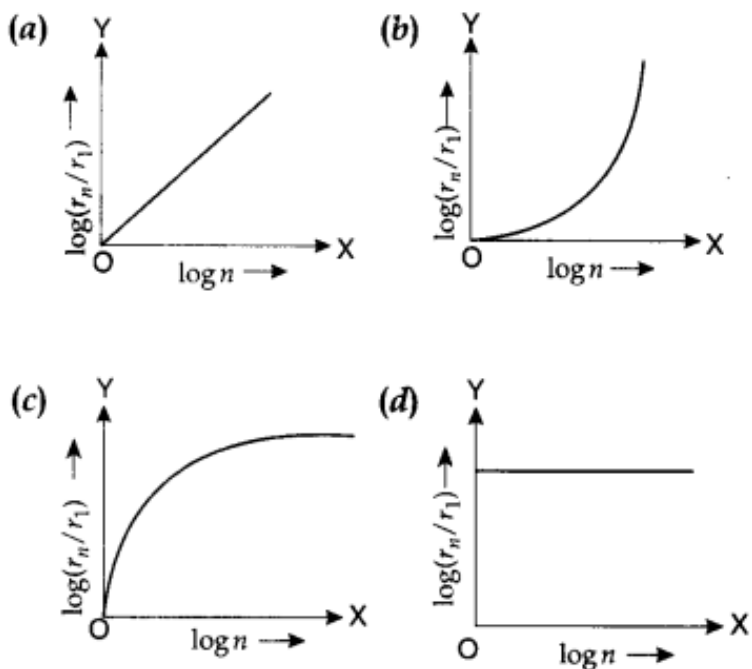


- (a) I
- (b) II
- (c) III
- (d) IV

▼ Answer

Answer: c

13. In a hydrogen atom, the radius of  $n^{\text{th}}$  Bohr orbit is  $r_n$ . The graph between  $\log(r_n/r_1)$  and  $\log n$  will be



▼ Answer

Answer: a