

اختبار تجريبي انسابير Session Review Physics Modern



تم تحميل هذا الملف من موقع المناهج الإماراتية

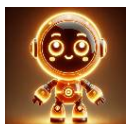
موقع المناهج ← المناهج الإماراتية ← الصف الثاني عشر المتقدم ← كيمياء ← الفصل الثالث ← اختبارات ← الملف

تاريخ إضافة الملف على موقع المناهج: 02:34:27 2026-06-18

ملفات اكتب للمعلم اكتب للطالب | اختبارات الكترونية | اختبارات | حلول | عروض بوربوينت | أوراق عمل
منهج انجليزي | ملخصات وتقارير | مذكرات وبنوك | الامتحان النهائي | للمدرس

المزيد من مادة
كيمياء:

التواصل الاجتماعي بحسب الصف الثاني عشر المتقدم



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف الثاني عشر المتقدم والمادة كيمياء في الفصل الثالث

اختبار تجريبي انسابير Session Review Physics Modern

1

نماذج تدريب على الهيكل (نموذج امتحان C مع الإجابة)

2

نماذج تدريب على الهيكل (نموذج امتحان C)

3

نماذج تدريب على الهيكل (نموذج امتحان B مع الإجابة)

4

نماذج تدريب على الهيكل (نموذج امتحان B)

5



$$E_k = \frac{1}{2}mc^2$$

ACADEMIC ASSESSMENT

Modern Physics Review Session

A professional guide to Quantum Mechanics, Atomic Models, and Nuclear Engineering concepts.



$$F = \frac{Gm_1m_2}{r^2}$$



PART 01

Atomic Structure & The Photoelectric Effect

QUESTION 01

An isotope of Nickel ${}^{60}_{28}\text{Ni}$ has a specific number of subatomic particles. Which of the following correctly identifies the composition of its nucleus?

A) 28 protons and 60 neutrons

B) 32 protons and 28 neutrons

C) 28 protons and 32 neutrons

D) 60 protons and 28 neutrons

QUESTION 02

In the photoelectric effect, if the intensity of incident light is doubled while frequency remains constant (above threshold), what occurs?

A) The max kinetic energy of photoelectrons will double.

B) The number of photoelectrons emitted per second will increase.

C) The stopping potential required will double.

D) No change will occur in the photoelectric current.

QUESTION 03

According to the Bohr model, an electron transitions from the $n=3$ energy level to the $n=1$ energy level. This process results in the:

A) Absorption of a photon.

B) Emission of a photon.

C) Increase in the orbital radius.

D) Ionization of the atom.

PART 02

Nuclear Forces & Wavelength Dynamics

QUESTION 04

The Strong Nuclear Force is responsible for keeping the nucleus stable. Which of the following is a characteristic property of this force?

A) It acts only between charged particles like protons.

B) It is a long-range force similar to the electric force.

C) It is an attractive force that acts between all nucleons.

D) It increases as the distance between nucleons increases.

QUESTION 05

A moving particle has a de Broglie wavelength (λ). If the velocity of the particle is doubled while its mass remains constant, the new wavelength is:

A) Doubled (2λ)

B) Quadrupled (4λ)

C) Halved ($\lambda/2$)

D) Unchanged

QUESTION 06

Which type of radiation spectrum consists of a series of bright lines on a dark background, produced by a hot, excited gas?

A) Continuous spectrum

B) Absorption spectrum

C) Emission spectrum

D) Fraunhofer lines

PART 03

Decay, Uncertainty & Binding Energy

QUESTION 07

A radioactive nucleus undergoes alpha (α) decay. How do the mass number (A) and atomic number (Z) of the daughter nucleus compare?

A) A decreases by 4, and Z decreases by 2.

B) A decreases by 2, and Z decreases by 4.

C) A remains the same, and Z increases by 1.

D) A decreases by 4, and Z remains the same.

QUESTION 08

In Heisenberg's Uncertainty Principle, if the measurement of position (Δx) becomes more precise, what must happen to the uncertainty in momentum (Δp)?

A) It must also decrease to maintain the ratio.

B) It must increase.

C) It remains constant.

D) It becomes zero.

QUESTION 09

Based on the Binding Energy per Nucleon curve, which of the following elements is considered the most stable?

A) Uranium-235

B) Hydrogen-2

C) Iron-56

D) Helium-4

Review Complete

PHYSICS EXAM PREPARATION • SERIES 01

Reference: Planck's Quantization & Bohr Atom Models

PART TWO

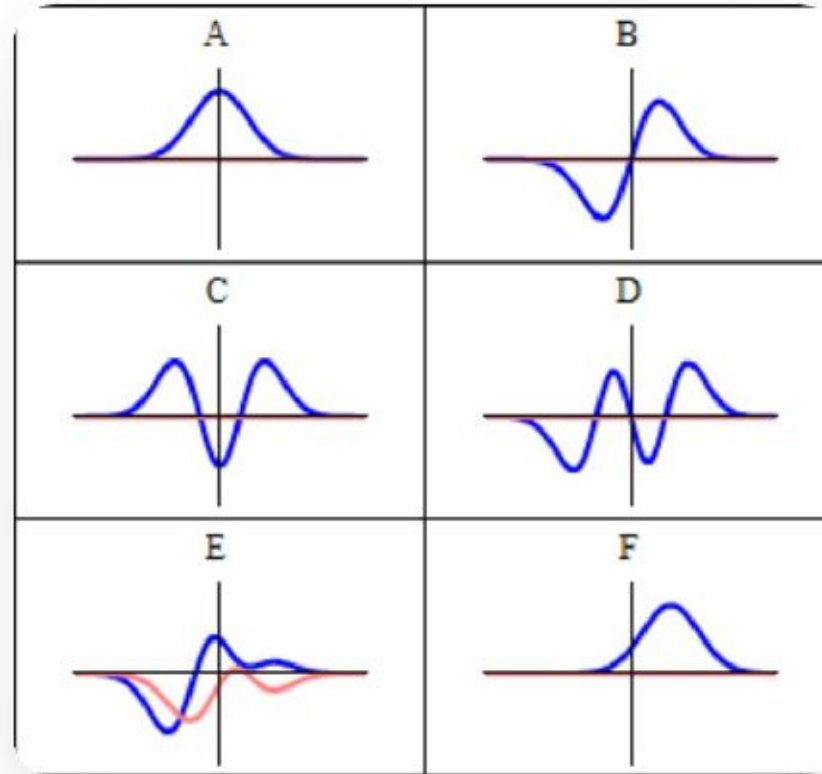
Modern Physics Mastery

Comprehensive Review of Quantum Systems & Nuclear Dynamics

SECTION IV

Photoelectric & Wave Mechanics

Analyzing frequency shifts and de Broglie wavelengths.



QUESTION 01

If the illumination frequency is changed from f to $1.5f$, what happens to the slope of the KE_{max} versus frequency graph?

A The slope will increase by a factor of 1.5.

B The slope will decrease significantly.

C The slope remains unchanged (Planck's constant).

D The slope remains unchanged (Work function).

QUESTION 02

A sample has an initial activity of 2000 Bq. If the half-life is 10 days, what is its activity after 30 days?

A 666.7 Bq

B 500 Bq

C 250 Bq

D 125 Bq

QUESTION 03

Radius r_n is proportional to n^2 . If the $n=1$ orbit radius is a_0 , what is the $n=4$ orbit radius?

A $4a_0$

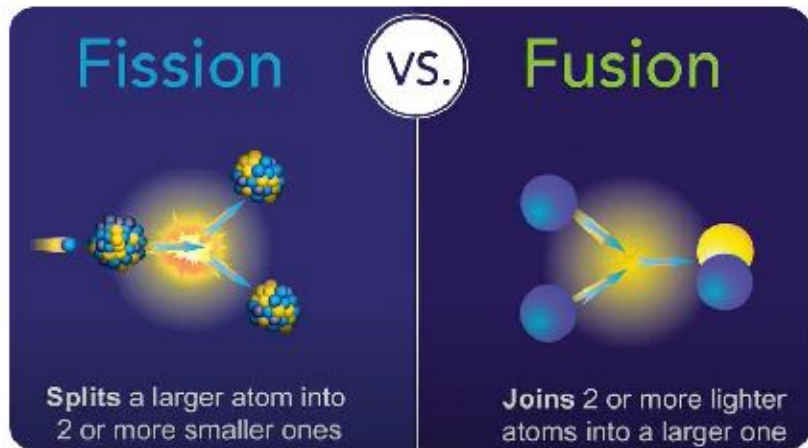
B $8a_0$

C $16a_0$

D $64a_0$

SECTION V

Nuclear Transitions & Spectral Analysis



QUESTION 05

A nucleus of $^{238}_{92}\text{U}$ undergoes alpha decay. What are the mass number (A) and atomic number (Z) of the daughter nucleus?

A A=234, Z=90

B A=238, Z=90

C A=234, Z=93

D A=236, Z=91

QUESTION 09

Compared to nuclear fission, nuclear fusion typically:

- A** Involves splitting a heavy nucleus like U-235.
- B** Releases a smaller amount of energy per reaction.
- C** Involves combining light nuclei to form heavier ones.
- D** Produces much more long-lived radioactive waste.

SECTION VI

Quantum Uncertainty & Orbit Stability

QUESTION 11

An electron transitions from $n=4$ to $n=2$ in hydrogen. The energy of the emitted photon is approximately:

A 0.85 eV

B 2.55 eV

C 3.40 eV

D 4.25 eV

QUESTION 16

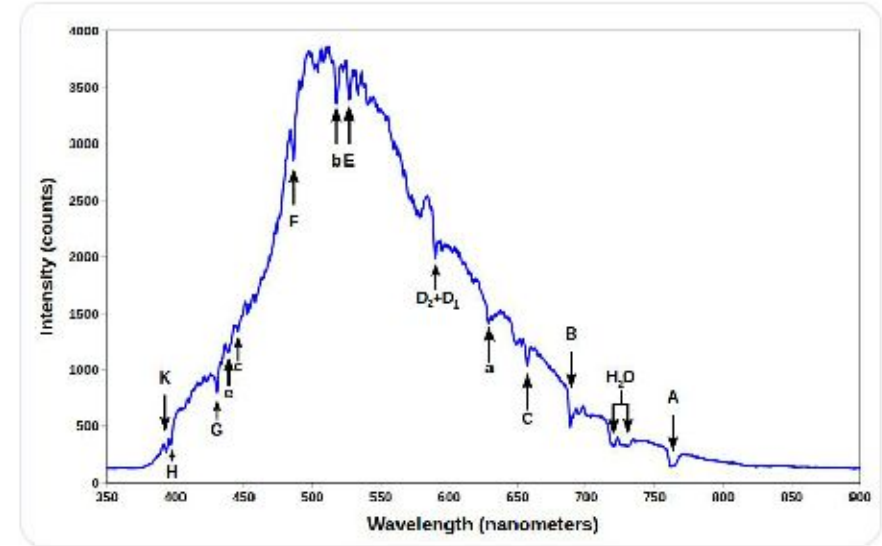
Fraunhofer lines, which appear as specific dark lines within the Sun's continuous spectrum, are an example of an:

A Emission spectrum

B Continuous spectrum

C Absorption spectrum

D Bright-line spectrum



End of Part Two

Review these core principles for final assessment success.



PART THREE

Physics Final Review

Closing Assessment: Quantum Limits, Atomic Stability & Scattering Events

ENERGY QUANTIZATION

Planck's concept suggests energy is emitted in discrete bundles. If an oscillator has frequency f , which total energy value is mathematically impossible?

A) $1.0 hf$

B) $2.0 hf$

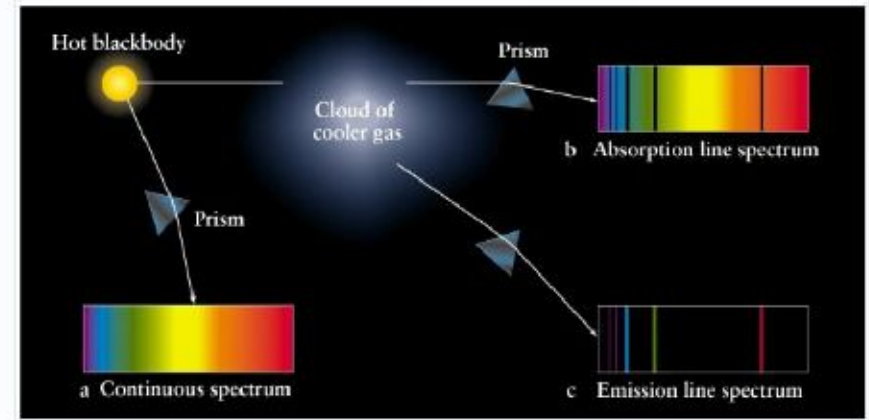
C) $2.5 hf$

D) $3.0 hf$

SPECTRAL ANALYSIS

Which of the following conditions is required to produce a discrete absorption spectrum?

- A) A hot, high-pressure gas.
- B) A hot, thin gas emitting specific wavelengths.
- C) White light passing through a cool gas sample.
- D) An incandescent solid glowing at high temp.



UNCERTAINTY PRINCIPLE

According to Heisenberg, if you use a shorter wavelength of radiation to locate a particle more precisely (Δx decreases), what happens to its momentum?

A) Momentum becomes more certain.

B) Momentum becomes less certain (high-energy collision).

C) Momentum remains unchanged.

D) Momentum becomes zero.

Heisenberg Uncertainty Principle

Simultaneously measuring both the exact position and precise momentum of a particle is impossible.

Uncertainty in position

Uncertainty in momentum

$$\Delta x \cdot \Delta p \geq \frac{h}{2\pi}$$



The principle also applies to other conjugate pairs in quantum mechanics, including position and velocity as well as energy and time.

sciencenotes.org

MASS DEFECT

The "missing mass" in a nucleus (mass defect) is accounted for by which of the following?

A) Kinetic energy of orbiting electrons.

B) Energy required to overcome the strong force.

C) Binding energy holding the nucleus together ($E=mc^2$).

D) Thermal energy released during decay.

ELECTRON ORBITS

In the de Broglie model, why can an electron only exist in specific stable orbits?

A) Circumference must be integer multiple of wavelength.

B) Electron velocity must equal speed of light.

C) Electric force must exceed nuclear force.

D) Electron must move in a straight line.

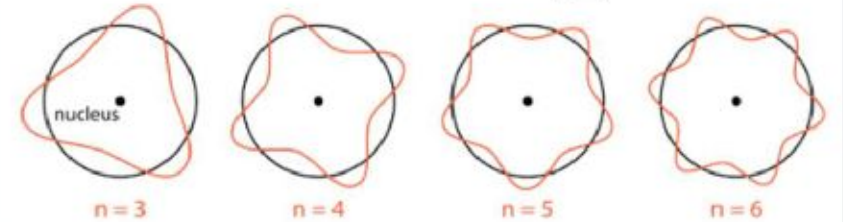
Visualization of electron waves for first three Bohr orbits

Electron wave resonance

$\lambda_1 = 2\pi r_1$

$2\lambda_2 = 2\pi r_2$

$3\lambda_3 = 2\pi r_3$



ALPHA TRANSMUTATION

A nucleus of Thorium-230 undergoes alpha decay. According to nuclear rules, the resulting daughter nucleus is:

A) Ra-230 (Z=88)

B) U-234 (Z=92)

C) Ra-226 (Z=88)

D) U-226 (Z=92)



WAVE-MATTER DUALITY

An electron and a proton move with the same velocity. Based on $\lambda = h/mv$, how does the electron's wavelength compare?

A) Shorter (electron is lighter).

B) Longer (electron is lighter).

C) Exactly the same.

D) Zero (it is a particle).

BINDING ENERGY

The stability of a nucleus is not determined by total mass alone, but primarily by its:

A) Total mass number (A).

B) Binding energy per nucleon.

C) Number of protons only.

D) Volume of the nucleus.

BOHR RADIUS

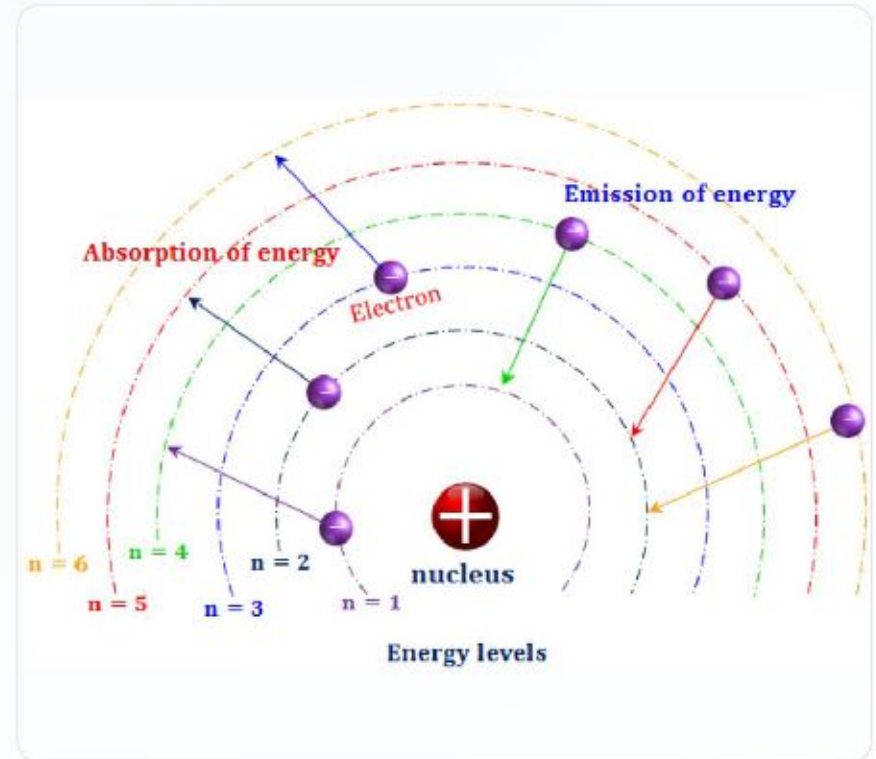
Radius r_n is proportional to n^2 . If the $n=1$ radius is 0.053 nm, what is the third orbit ($n=3$) radius?

A) 0.106 nm

B) 0.159 nm

C) 0.477 nm

D) 0.212 nm



SCATTERING EVENTS

During Compton scattering, a high-energy photon strikes an electron. Compared to the incident photon, the scattered photon always has:

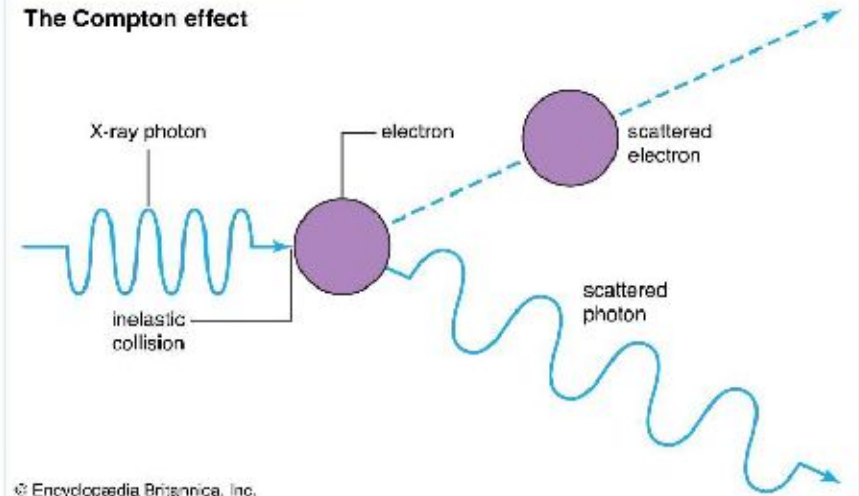
A) A higher frequency.

B) A shorter wavelength.

C) A lower frequency.

D) The same momentum.

The Compton effect



Review Complete

Assessment series concluded. Good luck with your examination.



سُبْحَانَكَ اللَّهُمَّ وَبِحَمْدِكَ، أَشْهَدُ أَنْ لَا إِلَهَ إِلَّا أَنْتَ، أَسْتَغْفِرُكَ وَأَتُوبُ إِلَيْكَ.

اللهم إني استودعتك ما قرأت، وما فهمت، وما حفظت، فردّه إليّ عند حاجتي إليه، وبارك لي في علمي ووقتي، وافتح عليّ فتوح العارفين، ووفّقني لما تحب وترضى، واجعل تعبى هذا نورًا ونجاحًا وبركة، ولا تكلني إلى نفسي طرفة عين.