

MODEL SIMULATION FOR THE END-OF-TERM 3 EXAMINATION 2025/2026



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف الثاني عشر المتقدم ← فيزياء ← الفصل الثالث ← ملفات متنوعة ← الملف

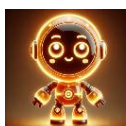
تاريخ إضافة الملف على موقع المناهج: 2026-05-26 17:15:46

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
فيزياء:

إعداد: Abdelbaset Mohamed

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 فيزياء في الفصل الثالث

MODEL SIMULATION FOR THE END-OF-TERM 3 EXAMINATION 2025/2026

1

حلول ميكل الامتحان النهائي 2026م

2

ميكل الامتحان النهائي 2026م غير محلول

3

الهيكل الوزاري بريدج - المعدل 2026

4

ملخص نواتج التعلم الكم والذرة

5

MODEL SIMULATION FOR THE END-OF-TERM 3 EXAMINATION 2025/2026
PHYSICS — STANDARD TERMINAL EVALUATION (MODEL 2)

	STUDENT NUMBER	
.....	STUDENT NAME	
.....	SCHOOL / CENTER	
Grade 12 Advanced (Physics)	CLASS / GRADE	
.....	SECTION GROUP	
Advanced Academic Track (General & Advanced Stream)	EDUCATION STREAM	
PHYSICS (Quantum Mechanics & Nuclear Physics Core)	SUBJECT DISCIPLINE	

PART ID Question Section	FIRST GRADER Marker 1	SECOND GRADER Marker 2	MODERATOR Reviewer			
	Name	Mark Achieved	Name	Mark Achieved	Name	Mark Achieved
PART 1 (25 MCQ)						

GRAND TOTAL Max Score		MARKER VERIFICATION Grading Official		REVIEWER MODERATION Moderation Auditor	
		Official Name	Signature	Official Name	Signature
	100 Marks	100 / 100			



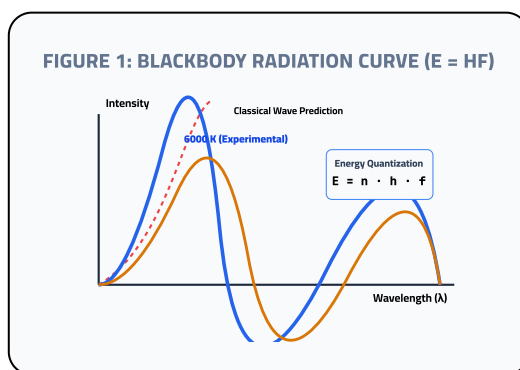
« ENCIRCLE THE LETTER CORRESPONDING TO THE CORRECT OPTION. EACH QUESTION CARRIES EXACTLY (4 MARKS) »

QUESTION NO. 1 LO 1: Planck's Quantum Concept and Energy of a Single Quantum

4 Marks

Calculate the energy of a single photon of light if its frequency is 5.0×10^{14} Hz. ($h = 6.63 \times 10^{-34}$ J·s)

REFERENCE FIGURE:



A 3.32×10^{-19} J

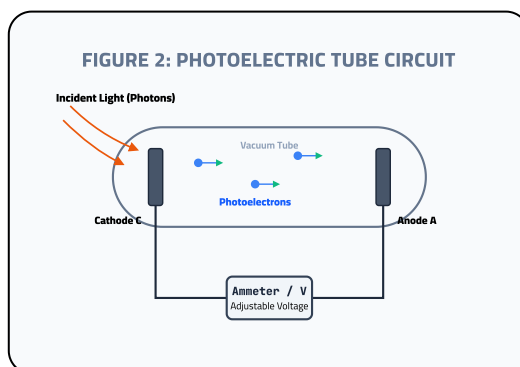
B 1.33×10^{-19} J

C 3.32×10^{-4} J

D 6.63×10^{-19} J

What is the name given to the subatomic particles emitted from the cathode of a photoelectric cell upon illumination?

REFERENCE FIGURE:

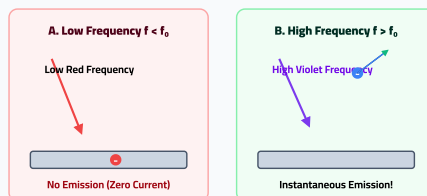


- | | |
|----------|----------------|
| A | Protons |
| B | Neutrons |
| C | Photoelectrons |
| D | Gamma photons |

What is the primary condition for the frequency of incident light (f) relative to the threshold frequency (f_0) for photoemission to occur?

REFERENCE FIGURE:

FIGURE 3: FREQUENCY VS. EMISSION CONDITION



A

$$f < f_0$$

B

$$f \geq f_0$$

C

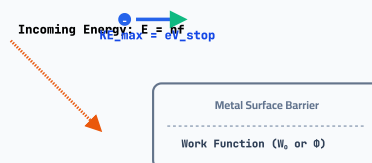
$$f = f_0 / 2$$

D

The wavelength must be zero

A photon of energy 5.8 eV strikes a metal with a work function of 2.3 eV. What is the maximum kinetic energy (KE_{max}) of the emitted electrons?

REFERENCE FIGURE:

FIGURE 4: ENERGY EQUATION ($KE_{\text{MAX}} = hf - \text{WORK_FUNCTION}$)

A 8.1 eV

B 3.5 eV

C 2.3 eV

D 1.15 eV

What is the direct effect of increasing incident light intensity (at constant $f \geq f_0$) on the resulting photoelectric current?

REFERENCE FIGURE:

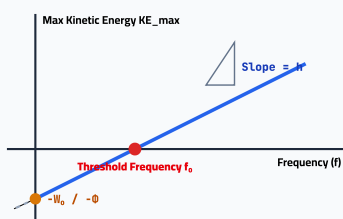
FIGURE 5: PHOTOELECTRIC INDEPENDENCE LAWS



- A** The current is directly proportional to intensity (it increases)
- B** The current drops to zero immediately
- C** The current remains constant while the stopping potential increases
- D** The current reverses and becomes alternating current

What does the x-intercept of the horizontal axis in the $KE_{\max}$ vs frequency graph represent?

REFERENCE FIGURE:

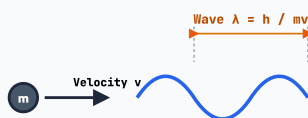
FIGURE 6: $KE_{\max}$ VS. FREQUENCY CURVE

- | | |
|---|--|
| A | The work function of the metal |
| B | The threshold frequency (f_0) of the metal |
| C | The maximum wavelength of the photoelectrons |
| D | The intensity of the incident light |

What is the correct formula to calculate the de Broglie wavelength (λ) associated with a particle of mass m and velocity v ?

REFERENCE FIGURE:

FIGURE 7: WAVE-PARTICLE DE BROGLIE CONCEPT



A $\lambda = h \cdot m \cdot v$

B $\lambda = h / (m \cdot v)$

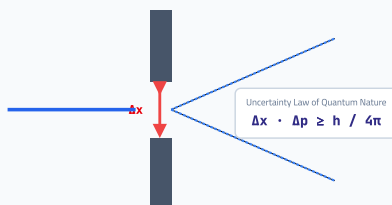
C $\lambda = m \cdot v / h$

D $\lambda = h \cdot c / v^2$

Which of the following inequalities mathematically represents Heisenberg's Uncertainty Principle?

REFERENCE FIGURE:

FIGURE 8: HEISENBERG UNCERTAINTY (LASER SLIT EXPERIMENT)



A $\Delta x \cdot \Delta p \geq h / 4\pi$

B $\Delta x \cdot \Delta p \leq hc / \lambda$

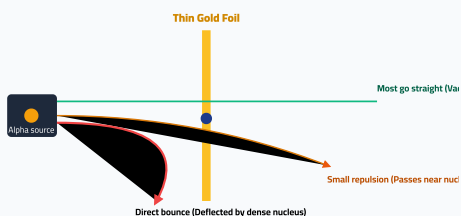
C $\Delta x / \Delta p = h / 2\pi$

D $\Delta x \cdot \Delta p = 0$

Which of the following particles did Rutherford launch as projectiles at the thin gold foil in his scattering experiment?

REFERENCE FIGURE:

FIGURE 9: RUTHERFORD GOLD FOIL ALPHA SCATTERING

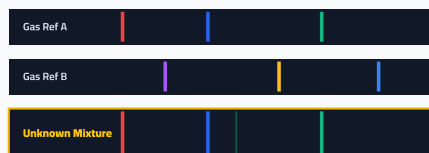


- | | |
|---|--|
| A | High-energy ultraviolet photons |
| B | Heavy, positively charged alpha particles (helium nuclei, ${}^4_2\text{He}^{2+}$) |
| C | Rapid, negatively charged beta particles |
| D | Neutral thermal neutrons |

Why is a line emission spectrum considered an elemental 'fingerprint' of a gas?

REFERENCE FIGURE:

FIGURE 10: IDENTIFICATION OF GASES VIA EMISSION LINES



- A** Because all elements hold the same number of electrons in their orbit
- B** Because each chemical element has a unique set of quantized energy levels, producing distinct photon wavelengths that do not match any other substance
- C** Because it is governed by the volume and weight of the gas cylinder
- D** Because the gas burns up upon thermal contact

How do the dark absorption lines of an element compare to its bright emission lines?

REFERENCE FIGURE:

FIGURE 11: CONTINUOUS VS. BLACK-LINE ABSORPTION SIGNATURE



Unique Absorption Spectrum Shows as Distinct Black Lines

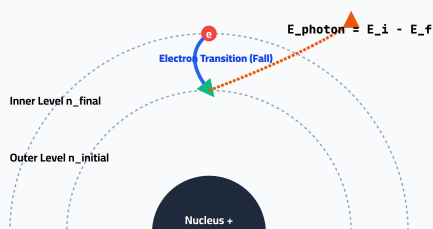
Missing wavelengths are unique fingerprints of elements

- A** They appear at the exact same wavelengths and positions on the spectral scale
- B** They are randomly shifted according to thermal classical wave mechanics
- C** The chemical absorption lines of any element are always shifted to red wavelengths
- D** There is no position overlap between the two spectra

Which of the following equations represents the energy of an emitted photon?

REFERENCE FIGURE:

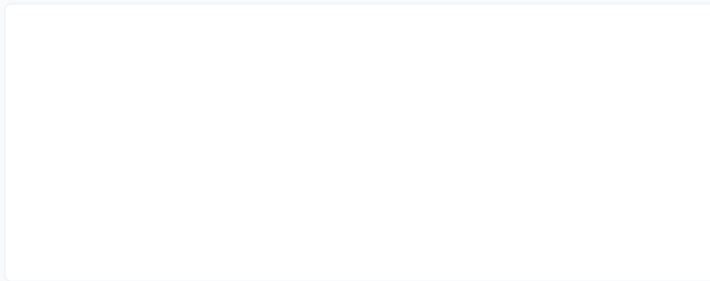
FIGURE 12: QUANTUM TRANSITION ENERGY LEVEL JUMP



- A $E_{\text{photon}} = E_i - E_f$
- B $E_{\text{photon}} = E_i + E_f$
- C $E_{\text{photon}} = E_f - E_i$
- D $E_{\text{photon}} = E_i \cdot E_f$

How does the radius of Bohr orbits (r_n) scale with the principal quantum number (n)?

REFERENCE FIGURE:

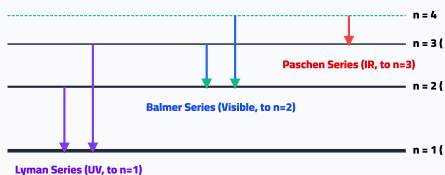


- A It is inversely proportional to n
- B It is directly proportional to n ($r_n \propto n$)
- C It is directly proportional to the square of n ($r_n \propto n^2$)
- D It is independent of n

Which spectral series of the hydrogen atom consists of visible wavelengths?

REFERENCE FIGURE:

FIGURE 15: HYDROGEN SPECTRAL EMISSION SERIES



A Lyman Series

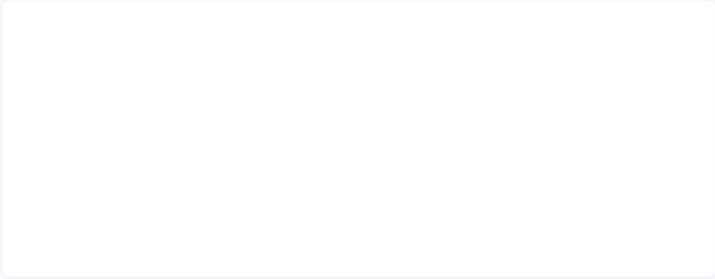
B Balmer Series (Visible)

C Paschen Series

D Brackett Series

What is the definition of an atomic 'orbital' in modern quantum theory?

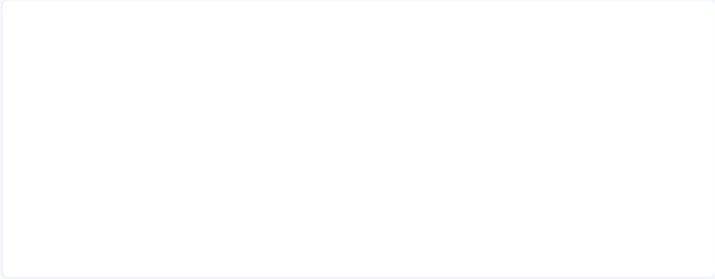
REFERENCE FIGURE:



- | | |
|---|---|
| A | The mechanical path that the electron follows as it orbits |
| B | A three-dimensional probability region around the nucleus where an electron is likely to be found |
| C | The distance representing the outer radius of the proton |
| D | The spiral channel where alpha particles decay |

What is 'Stimulated Emission'?

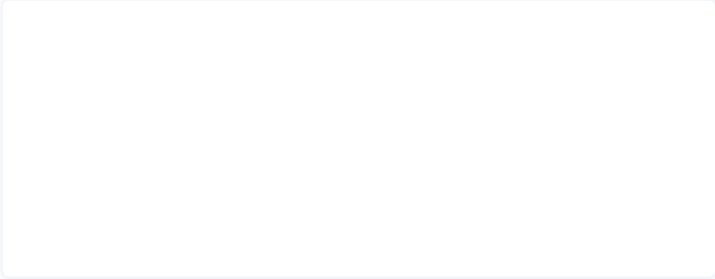
REFERENCE FIGURE:



- A** An excited electron falls to a lower state spontaneously, releasing a random photon
- B** An incoming photon matching the transition energy prompts an excited electron to fall, releasing an identical secondary photon in phase and direction
- C** The heating of metal to release electrons through thermal currents
- D** The capture of light photons by nuclear strong forces

How are isotopes of the same chemical element defined?

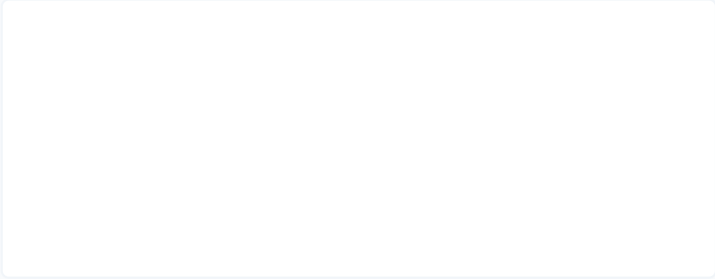
REFERENCE FIGURE:



- | | |
|---|--|
| A | Atoms with the same mass number A but different proton counts |
| B | Atoms with the same positive charge count Z (protons) but different neutron counts N |
| C | Atoms that have lost their electron clouds completely |
| D | Atoms with differing electron charges |

What is meant by the term 'Nuclear Mass Defect' (Δm)?

REFERENCE FIGURE:

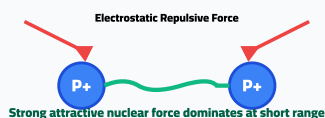


- | | |
|---|--|
| A | The mass of neutrons that escape during nuclear fission |
| B | The difference between the sum of the masses of individual nucleons and the actual mass of the assembled nucleus |
| C | The loss of mass due to electron shell transitions |
| D | The decay of protons into energy over atomic lifetimes |

Which of the following describes the effective range of the strong nuclear force?

REFERENCE FIGURE:

FIGURE 19: STRONG NUCLEAR FORCE VS. ELECTROSTATIC REPULSION

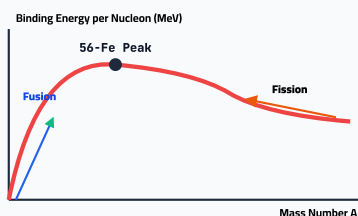


- | | |
|---|---|
| A | It has an infinite range, decreasing gradually over light-years |
| B | It is extremely short-ranged, operating only within nuclear dimensions and dropping to zero beyond roughly 10^{-15} m |
| C | It is directly proportional to the square of the projectile's speed |
| D | It only operates within the outermost orbit of the hydrogen atom |

Which isotope sits at the absolute peak of the binding energy per nucleon curve, representing the most stable nucleus in the universe?

REFERENCE FIGURE:

FIGURE 20: BINDING ENERGY CURVE PER NUCLEON



A Uranium-238 (^{238}U)

B Helium-4 (^4He)

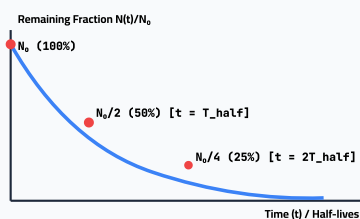
C Iron-56 (^{56}Fe)

D Carbon-14 (^{14}C)

Which of the following occurs inside the nucleus during beta-minus (β^-) decay?

REFERENCE FIGURE:

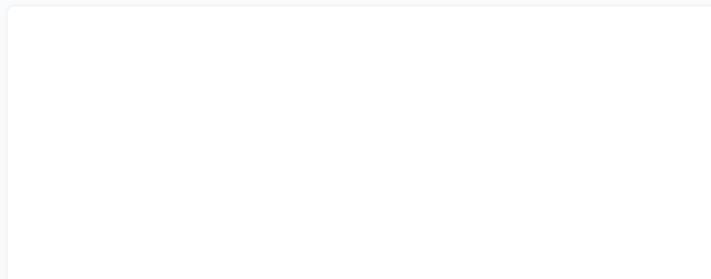
FIGURE 24: EXPONENTIAL RADIOACTIVE DECAY CURVE



- A** A proton decays into a neutron and an electron
- B** A neutron decays into a proton, an emitted electron (beta particle), and an antineutrino
- C** The nucleus emits a helium nucleus to increase stability
- D** Two protons fuse into an alpha particle

A sample initially contains 1000 active nuclei. After three half-lives have elapsed, how many parent nuclei remain active?

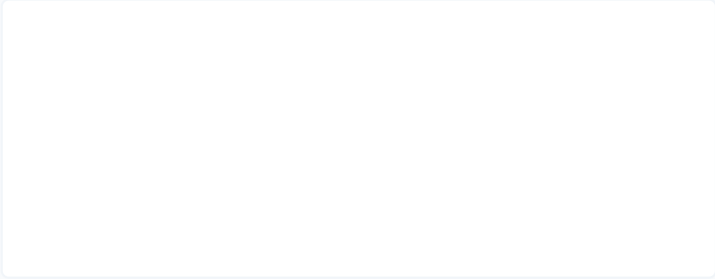
REFERENCE FIGURE:



- | | |
|---|------------|
| A | 500 nuclei |
| B | 125 nuclei |
| C | 250 nuclei |
| D | 0 nuclei |

What role do 'Control Rods' (made of boron or cadmium) play inside a nuclear reactor?

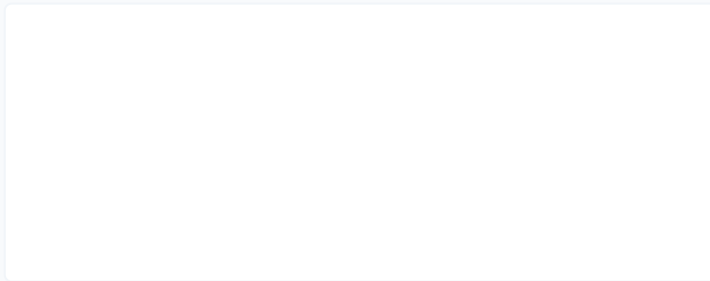
REFERENCE FIGURE:



- | | |
|---|--|
| A | They slow down fast neutrons to maintain reaction stability |
| B | They absorb excess neutrons to regulate the rate of the chain reaction and prevent overheating |
| C | They act as fuel to sustain fission |
| D | They convert gamma radiation into electrical current |

Which nuclear process powers the Sun and other stars, sustaining their heat and energy output over billions of years?

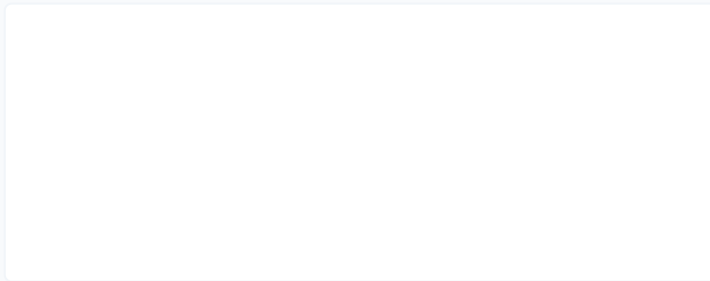
REFERENCE FIGURE:



- | | |
|---|---|
| A | Uranium coal combustion |
| B | Controlled heavy uranium fission |
| C | Nuclear Fusion (specifically the proton-proton chain) |
| D | Alpha decay inside iron nuclei |

What are the quark combinations that compose a proton and a neutron, respectively?

REFERENCE FIGURE:



A Proton: uud; Neutron: udd

B Proton: udd; Neutron: uud

C Proton: uuu; Neutron: ddd

D Proton: uuu; Neutron: udd