

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

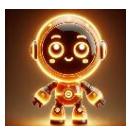
تاريخ إضافة الملف على موقع المناهج: 2026-05-26 17:07:08

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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

حلول ميكل الامتحان النهائي 2026م

1

ميكل الامتحان النهائي 2026م غير محلول

2

الهيكل الوزاري بريدج - المعدل 2026

3

ملخص نواتج التعلم الكم والذرة

4

منهج بريدج ميكل الامتحان النهائي 2026م

5

MODEL SIMULATION FOR THE END-OF-TERM 3 EXAMINATION 2025/2026
PHYSICS — STANDARD TERMINAL EVALUATION (MODEL 1)

	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			



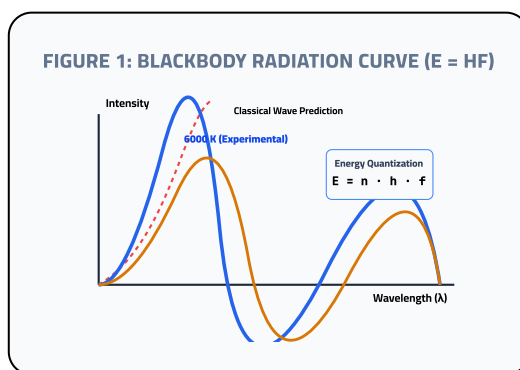
« ENCIRCLE THE LETTER CORRESPONDING TO THE CORRECT OPTION. EACH QUESTION CARRIES EXACTLY (4 MARKS) »

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

4 Marks

What does the concept of 'energy quantization' proposed by Max Planck mean?

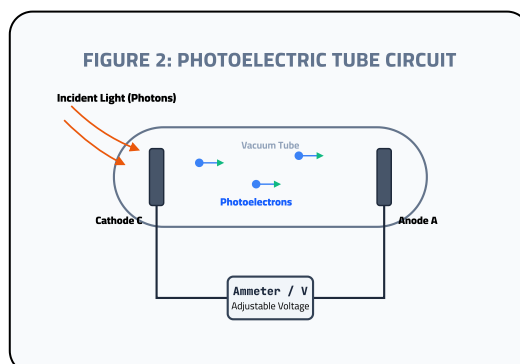
REFERENCE FIGURE:



- A Radiation energy is emitted in a continuous and uninterrupted stream
- B The energy of vibrating atoms cannot increase under any circumstances
- C Energy is emitted or absorbed only in discrete, definite packets called quanta
- D The energy of a photon is always equal to the mass of an electron

What is the precise academic definition of the 'Photoelectric Effect'?

REFERENCE FIGURE:

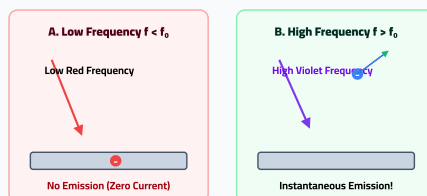


- | | |
|----------|---|
| A | The generation of nuclear energy from alpha particle collisions with gas |
| B | The emission of electrons from a metal surface when light of appropriate frequency strikes it |
| C | The refraction of light as it passes through a polarising crystal |
| D | The transition of an electron from a lower Bohr orbit to a higher orbit |

What is the precise definition of 'Threshold Frequency' (f_0)?

REFERENCE FIGURE:

FIGURE 3: FREQUENCY VS. EMISSION CONDITION



- A** The maximum frequency of light that releases electrons at the speed of light
- B** The minimum frequency of incident light required to release electrons from a metadata surface
- C** The average electromagnetic frequency reflected by the atmosphere
- D** The minimum frequency required to bind a neutron to a proton

Which of the following equations represents Einstein's photoelectric formulation?

REFERENCE FIGURE:

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

Incoming Energy $E = hf$
 $KE_{\text{max}} = eV_{\text{stop}}$

Metal Surface Barrier

Work Function (W_0 or Φ)

A $KE_{\text{max}} = hf - \Phi$

B $KE_{\text{max}} = hf + \Phi$

C $KE_{\text{max}} = \Phi - hf$

D $KE_{\text{max}} = p \cdot v / 2$

How does increasing the intensity of incident light (at constant suitable frequency) affect the maximum kinetic energy ($KE_{\max}$) of emitted photoelectrons?

REFERENCE FIGURE:

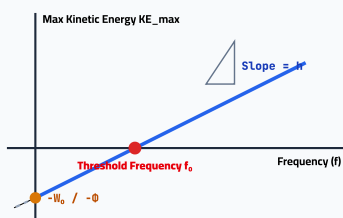
FIGURE 5: PHOTOELECTRIC INDEPENDENCE LAWS



- A** The maximum kinetic energy increases linearly
- B** The maximum kinetic energy decreases to zero
- C** The maximum kinetic energy remains completely unaffected
- D** The kinetic energy is converted into nuclear energy

When plotting $KE_{\max}$ of photoelectrons on the y-axis versus incident frequency (f) on the x-axis, what is the significance of the graph's slope?

REFERENCE FIGURE:

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

A It represents the work function (Φ) of the metal

B It represents the threshold frequency (f_0)

C It represents Planck's constant (h)

D It represents the charge of an electron

What does Louis de Broglie's hypothesis state regarding the wave-particle duality of matter?

REFERENCE FIGURE:

FIGURE 7: WAVE-PARTICLE DE BROGLIE CONCEPT

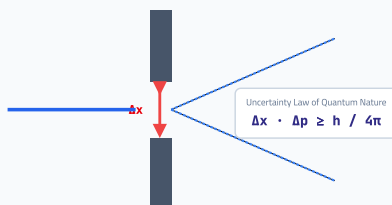


- | | |
|---|---|
| A | Photons lose their wave characteristics entirely over time |
| B | Moving physical particles have associated wave-like properties, just as light waves have particle-like properties |
| C | Atoms are completely hollow and contain no negatively charged particles |
| D | Time moves in circular orbits aligned with planetary motion |

What is the physical meaning of Heisenberg's Uncertainty Principle?

REFERENCE FIGURE:

FIGURE 8: HEISENBERG UNCERTAINTY (LASER SLIT EXPERIMENT)

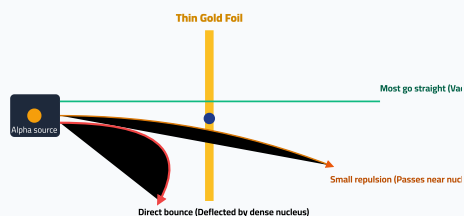


- | | |
|---|---|
| A | It is impossible to observe electrons inside heavy metal nuclei |
| B | It is impossible to measure both the mass and charge of an electron at the same time |
| C | It is impossible to simultaneously determine both the exact position and momentum of a particle with absolute certainty |
| D | All particles decay instantly when constrained inside a modern vacuum chamber |

How did J.J. Thomson describe the internal structure of the atom in his classical Plum Pudding model?

REFERENCE FIGURE:

FIGURE 9: RUTHERFORD GOLD FOIL ALPHA SCATTERING

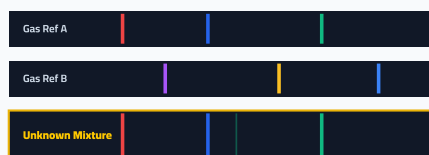


- | | |
|---|--|
| A | A dense positive central nucleus surrounded by rapid orbiting electrons |
| B | A homogeneous solid sphere of positive charge with negative electrons embedded throughout like raisins |
| C | A hollow probabilistic probability cloud harboring dielectric gaps |
| D | Indivisible physical atoms that fuse upon thermal contact |

What is seen on a spectrometer screen when observing light emitted from a excited low-pressure gas?

REFERENCE FIGURE:

FIGURE 10: IDENTIFICATION OF GASES VIA EMISSION LINES



- A** A continuous rainbow spectrum without any dark lines
- B** A discrete series of bright, colored lines separated by dark intervals on a black background
- C** A pure white light beam that exhibits no diffraction at all
- D** A random emission of heavy alpha particles

How is an absorption-line spectrum formed in modern physics?

REFERENCE FIGURE:

FIGURE 11: CONTINUOUS VS. BLACK-LINE ABSORPTION SIGNATURE



Unique Absorption Spectrum Shows as Distinct Black Lines

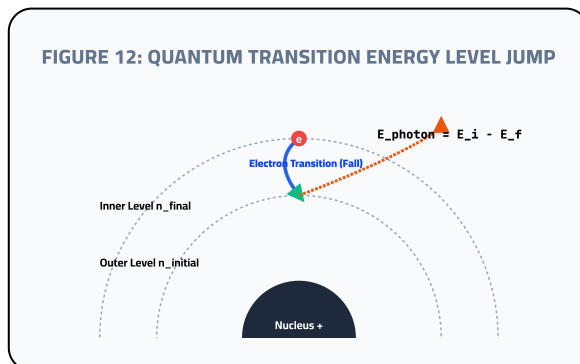
Missing wavelengths are unique fingerprints of elements

- A** By evaporating heavy radioactive elements in an insulated chamber
- B** By passing continuous white light through a cool gas, which absorbs specific wavelengths and leaves dark lines in the spectrum
- C** By accelerating cathode electrons beyond the speed of light
- D** By doubling the frequency of incident UV light to overcome binding

Under what conditions does a hydrogen atom emit a single photon?

REFERENCE FIGURE:

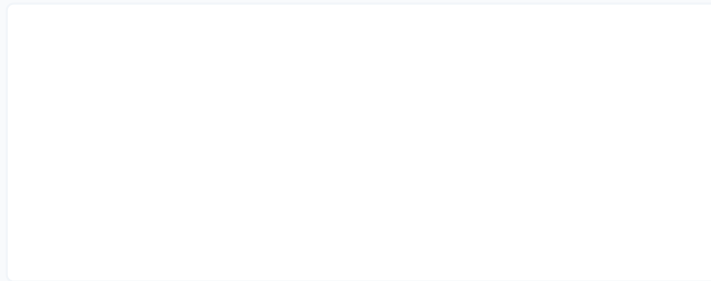
FIGURE 12: QUANTUM TRANSITION ENERGY LEVEL JUMP



- | | |
|---|---|
| A | When an electron stays stable in its ground state orbit ($n=1$) |
| B | When an electron transitions from a higher energy level to a lower energy level |
| C | When an alpha particle is captured by the nuclear force |
| D | When the entire atom is cooled near absolute zero Kelvin |

What is the radius of the ground state orbit ($n = 1$) of a hydrogen atom in Bohr's model?

REFERENCE FIGURE:

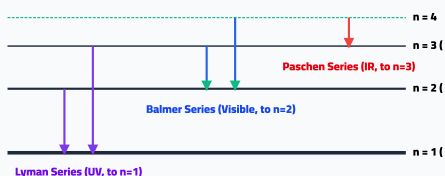


- | | |
|---|--------------------------------------|
| A | 0.53 Å (or 5.29×10^{-11} m) |
| B | 1.06 Å |
| C | 2.12 Å |
| D | 0.01 Å |

Which of the following physical series occurs when excited electrons transition and drop to the ground state ($n = 1$) of hydrogen?

REFERENCE FIGURE:

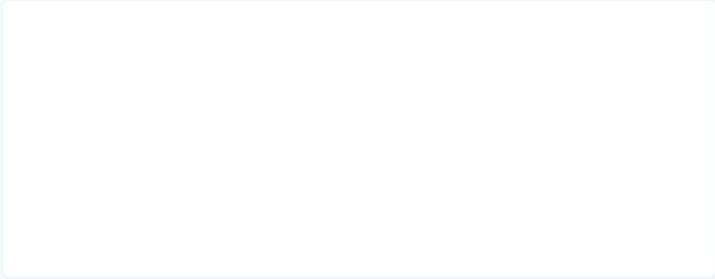
FIGURE 15: HYDROGEN SPECTRAL EMISSION SERIES



- A Balmer Series
- B Paschen Series
- C Lyman Series (Ultraviolet)
- D Pfund Series

How does the modern quantum mechanical model of the atom describe the position of an electron?

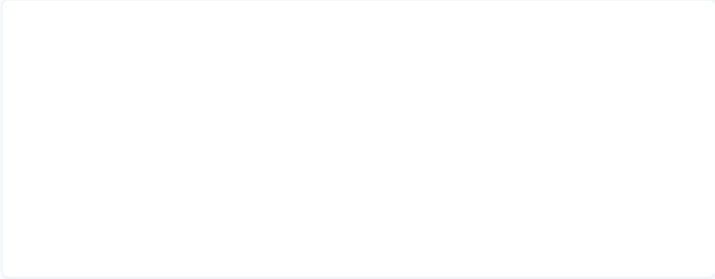
REFERENCE FIGURE:



- | | |
|---|--|
| A | It tracks the electron along a precise, circular, predictable path |
| B | It defines a three-dimensional region of space (orbital) represents high probability of finding the electron |
| C | It expects electrons to collapse into the nucleus every second |
| D | It models electrons as stationary, non-moving points |

What does the word acronym 'LASER' stand for in physics?

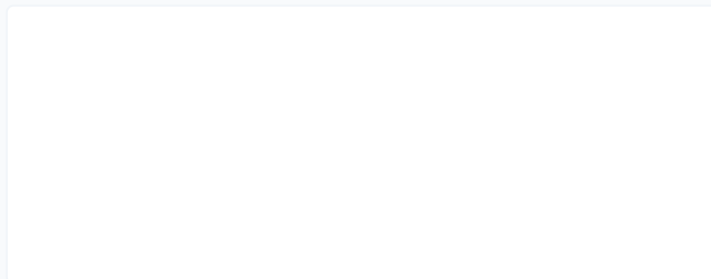
REFERENCE FIGURE:



- | | |
|---|--|
| A | Light Absorption by Stimulated Emission of Radiation |
| B | Light Amplification by Stimulated Emission of Radiation |
| C | Long Wave Amplification by Stimulated Electron Resonance |
| D | Light Accumulation by Spontaneous Emission of Radiation |

What is the relationship between the mass number (A), original atomic number (Z), and neutron number (N) of a nucleus?

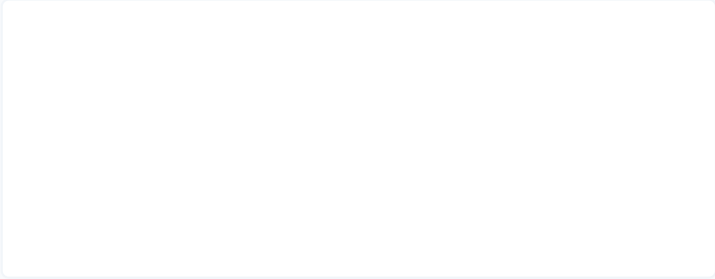
REFERENCE FIGURE:



A	$A = Z + N$
B	$A = Z - N$
C	$Z = A + N$
D	$N = Z \cdot A$

What is the primary role of the 'Strong Nuclear Force' inside the atomic nucleus?

REFERENCE FIGURE:

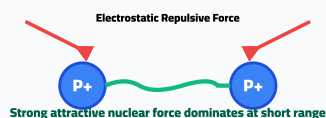


- A** To attract electrons and force them to collapse into the nucleus
- B** To bind nucleons together (protons and neutrons) and overcome the electrostatic repulsion of positive protons
- C** To drive radioactive beta decay over macroscopic distances
- D** An electromotive force that spins the atoms

What is the primary physical function of the 'Strong Nuclear Force' inside the nucleus?

REFERENCE FIGURE:

FIGURE 19: STRONG NUCLEAR FORCE VS. ELECTROSTATIC REPULSION

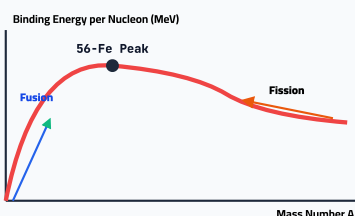


- | | |
|---|---|
| A | To attract electrons and keep them in stable Bohr orbits |
| B | To bind protons and neutrons together, overcoming the immense electrostatic Coulomb repulsion between protons |
| C | To generate distinct absorption lines in cool atomic gases |
| D | To accelerate photocurrent inside a zinc electrode |

Which of the following parameters is used as the direct measure of nuclear stability?

REFERENCE FIGURE:

FIGURE 20: BINDING ENERGY CURVE PER NUCLEON

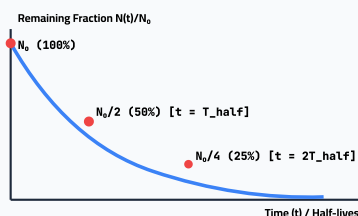


- A The Bohr first orbit radius
- B The binding energy per nucleon (E_b/A)
- C The absolute atomic mass of the nucleus
- D The neutron count divided by Planck's constant

When a radioactive nucleus undergoes alpha decay, what are the changes to its mass number (A) and atomic number (Z)?

REFERENCE FIGURE:

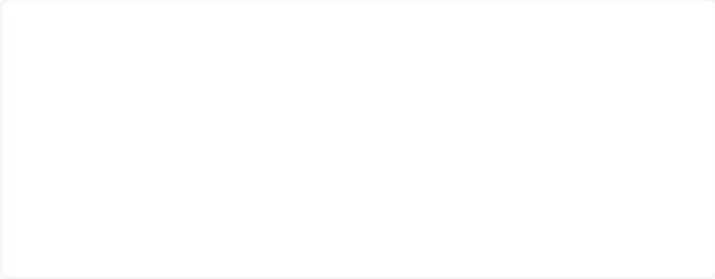
FIGURE 24: EXPONENTIAL RADIOACTIVE DECAY CURVE



- A** A decreases by 4, Z decreases by 2
- B** A remains unchanged, Z increases by 1
- C** A increases by 4, Z increases by 2
- D** Both A and Z remain completely unchanged

Which of the following defines the 'Half-Life' ($T_{1/2}$) of a radioactive isotope?

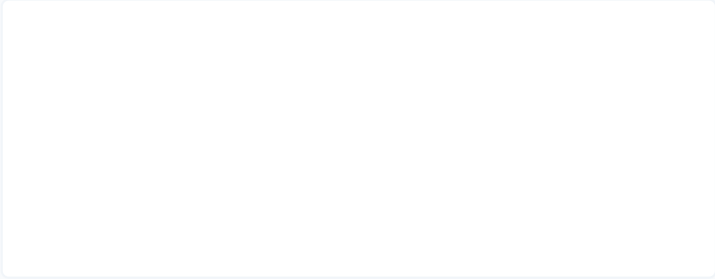
REFERENCE FIGURE:



- A The total lifetime of the entire radioactive sample
- B The time required for exactly half of the radioactive nuclei in a sample to decay
- C The time required for all protons to convert into neutrons
- D The time it takes for a nucleus to complete one orbit

What is nuclear fission?

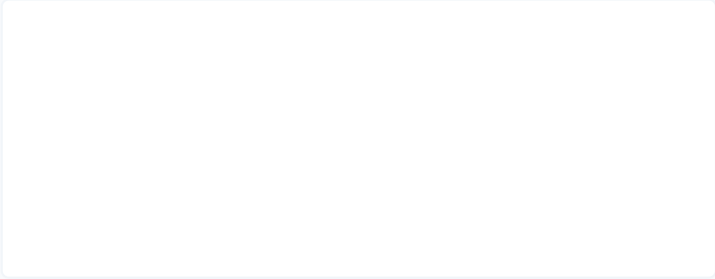
REFERENCE FIGURE:



- | | |
|---|--|
| A | The combining of light nuclei to form a heavier nucleus |
| B | The splitting of a heavy, unstable nucleus into lighter fragments, releasing energy and neutrons |
| C | The decay of protons into free neutrons and positrons |
| D | The absorption of electrons by the strong nuclear force |

What is nuclear fusion?

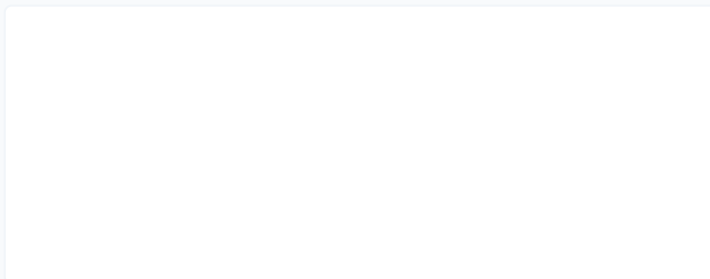
REFERENCE FIGURE:



- | | |
|---|--|
| A | The splitting of a heavy nucleus into lighter fragments |
| B | The combining of light nuclei to form a heavier, more stable nucleus, releasing energy |
| C | The radioactive decay of unstable neutrons |
| D | The capture of free electrons by atomic orbit fields |

According to the Standard Model, which of the following is classified as a truly fundamental elementary particle that cannot be split?

REFERENCE FIGURE:



- A The Proton
- B The Neutron
- C The Electron (Lepton)
- D The Alpha particle

« END OF EXAMINATION (MODEL 1) »