

امتحان نموذج جسيم الموجة التأثير الكهروضوئي وكمية الطاقة



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: 2026-05-04 18:20:54

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

المزيد من مادة
فيزياء:

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

اختبار فيزياء منهج حكومي

1

انسباير ملزمة الوحدة الثانية تحليل أسئلة الفيزياء النووية حول النواة والاضمحلال الإشعاعي

2

انسباير ملزمة الوحدة الأولى حول التأثير الكهروضوئي وكومتون ودي برولي

3

ملخص وأوراق عمل الدرس الأول Nucleus The من وحدة physics particle and Nuclear منهج انسباير

4

مذكرة الدرس الثاني Atom the and Theory Quantum من وحدة Atoms in Electrons منهج انسباير

5



امتحان الفصل الدراسي الثالث

End of Term 3 Exam

Academic Year 2025 – 2026

Student Information

Student No / رقم الطالب	
Student Name / اسم الطالب	
School Name / اسم المدرسة	
Grade & Stream / الصف والمسار	الثاني عشر المتقدم
Subject / المادة	Inspire Physics الفيزياء – انسبير

يُملأ هذا الجدول بدقة تامة من قبل لجنة التقدير This table is to be filled by markers

المراجع Revise	المقّر 2 Marker 2	المقّر 1 Marker 1	Mark الدرجة	Question No. رقم السؤال
				الجزء الأول 80 درجة
				الجزء الثاني 20 درجة
				الدرجة المستحقة Allotted Mark

اختبار علي الدرس الأول فقط

الاختبار غير كامل

Physics Exam: Particle Model of Waves

Total: 50 marks

Section A: 25 MCQs × 1 mark = 25 marks

Section B: 3 FRQs = 25 marks

Useful constants:

$$h = 6.63 \times 10^{-34} \text{ J.s}$$

$$c = 3.00 \times 10^8 \text{ m/s}$$

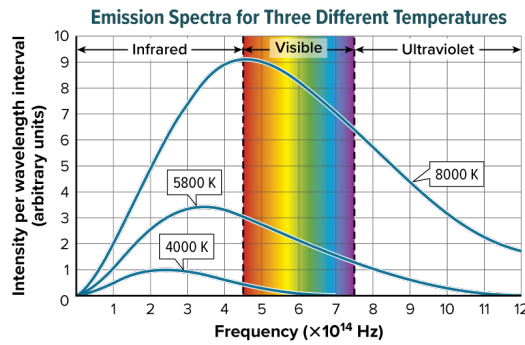
$$1 \text{ eV} = 1.602 \times 10^{-19} \text{ J}$$

$$E(\text{eV}) = \frac{1240}{\lambda(\text{nm})}$$

Section A: 25 Tricky MCQs

1. Which phenomenon is **not fully explained** by the classical electromagnetic wave model?

- A. Diffraction of light
- B. Interference of light
- C. Polarization of light
- D. Photoelectric emission from metals



2. Which statement is best supported by the diagram?

- A. A 4000 K object emits no visible radiation.
- B. A 5800 K object emits radiation only in the visible region.
- C. An 8000 K object emits more ultraviolet radiation than a 4000 K object.
- D. All three objects have their maximum intensity in the visible region.

3. If the kelvin temperature of a radiating object is doubled, the total power emitted becomes:

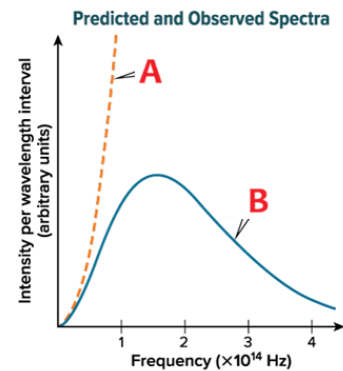
- A. 2 times larger
- B. 4 times larger
- C. 8 times larger
- D. 16 times larger

4. Planck proposed that vibrating atoms emit or absorb energy:

- A. Continuously, at any value
- B. Only in whole-number multiples of hf
- C. Only when their temperature is zero
- D. Only as visible light

5. What is the main problem with the red/orange dashed prediction line labelled **A**?

- A. It predicts that intensity becomes zero at high frequency
- B. It matches the observed spectrum perfectly
- C. It predicts that frequency has no effect on intensity
- D. It predicts infinite energy at high frequency



6. Which statement best distinguishes Einstein's photon theory from Planck's hypothesis?

- A. Planck said light has no energy; Einstein said it does.
- B. Planck quantized atomic energy changes; Einstein said light itself comes in photons.
- C. Planck explained the Compton effect; Einstein explained diffraction.
- D. Einstein rejected quantized energy.

7. Which photon has the greatest energy?

- A. 4.0eV
- B. 320nm
- C. 811nm
- D. 2.1eV

8. What is the approximate energy of a photon with wavelength 620nm?

- A. 0.50eV
- B. 1.00eV
- C. 2.00eV
- D. 4.00eV

9. In the photoelectric effect, electrons are emitted only if the incident light has:

- A. High enough intensity
 - B. Low enough speed
 - C. Frequency at or above the threshold frequency
 - D. Long enough wavelength
-

10. For light above the threshold frequency, increasing intensity mainly increases:

- A. The energy of each photon
 - B. The maximum kinetic energy of each photoelectron
 - C. The number of emitted electrons per second
 - D. The threshold frequency of the metal
-

11. For light above the threshold frequency, increasing frequency mainly increases:

- A. The maximum kinetic energy of emitted electrons
 - B. The work function of the metal
 - C. The number of photons in the beam only
 - D. The speed of light in vacuum
-

12. The work function of a metal is:

- A. The maximum kinetic energy of an emitted electron
- B. The minimum energy required to eject an electron
- C. The energy of all photons hitting the surface
- D. The current produced in a photocell

13. A metal has threshold wavelength 500nm. What is its work function?

- A. 0.40eV
 - B. 1.24eV
 - C. 2.48eV
 - D. 5.00eV
-

14. A metal has work function 2.0eV. Light of photon energy 3.5eV shines on it. The maximum kinetic energy of emitted electrons is:

- A. 1.5eV
 - B. 2.0eV
 - C. 3.5eV
 - D. 5.5eV
-

15. A metal has work function 4.0eV. Light of energy 3.2eV shines on it. What is the maximum kinetic energy of the emitted electrons?

- A. -0.8eV
 - B. 0eV because no electrons are emitted
 - C. 0.8eV
 - D. 7.2eV
-

16. A photocell has a stopping potential of 3.6V. The maximum kinetic energy of the photoelectrons is:

- A. 3.6J
 - B. 3.6eV
 - C. 0.28eV
 - D. 5.8×10^{-18} eV
-

17. A stopping potential of 2.0V corresponds to maximum kinetic energy:

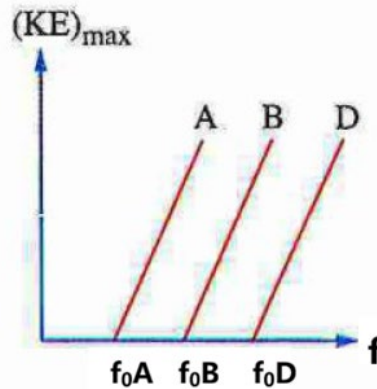
- A. $2.0 \times 10^{-19} \text{ J}$
- B. $3.2 \times 10^{-19} \text{ J}$
- C. $6.63 \times 10^{-34} \text{ J}$
- D. $1.24 \times 10^3 \text{ J}$

18.

The opposite figure represents the relationship between the frequency of incident light on the surfaces of three metals A, B, D and the maximum kinetic energy of the emitted electrons from them. If the work functions of these metals are E_A, E_B, E_D , then:

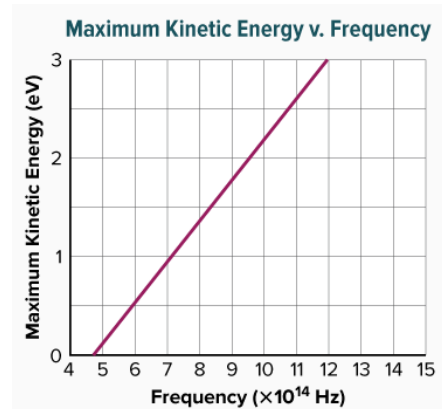
الشكل المقابل يمثل العلاقة بين تردد الضوء الساقط على أسطح ثلاثة فلزات A, B, D وأقصى طاقة حركة للإلكترونات المنبعثة منها، فإذا كانت دوال الشغل لهذه الفلزات هي E_A, E_B, E_D فإن:

- 1. $E_A = E_B < E_D$
- 2. $E_A < E_B < E_D$
- 3. $E_A = E_B = E_D$
- 4. $E_A > E_B > E_D$



19. On a photoelectric graph of KE_{max} versus frequency, the x -intercept represents:

- A. Work function
- B. Threshold frequency
- C. Photon momentum
- D. Stopping potential



20. **y-intercept meaning**

For a KE_{max} versus frequency graph, the y -intercept represents:

- A. $+W$
- B. $-W$
- C. f_0
- D. h

21. Solar cells produce electric current because photons:

- A. Heat the wires until electrons boil away
- B. Reflect from the semiconductor surface
- C. Have enough energy to free electrons in the material
- D. Slow down when passing through glass

22. **Compton effect**

In the Compton effect, a scattered X-ray photon usually has:

- A. Shorter wavelength and higher energy
- B. Zero frequency after collision
- C. Same wavelength and no momentum
- D. Longer wavelength and lower energy

23. Which comparison is correct?

- A. In the photoelectric effect, photons scatter; in the Compton photons are absorbed.
 - B. In the photoelectric effect, photons are absorbed; in the Compton photons scatter.
 - C. Both effects prove only the wave model of light.
 - D. Neither effect involves electrons.
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FRQ 2: Photoelectric Effect Calculation and Explanation — 9 marks

A metal surface has a work function of 2.30eV . Light of wavelength 400nm shines on the surface.

- a. Calculate the energy of one photon in eV.
 - b. Determine whether electrons are emitted. Explain.
 - c. Calculate the maximum kinetic energy of the emitted electrons in eV.
 - d. Find the stopping potential.
 - e. Explain what would happen if the same metal were illuminated with very intense light of wavelength 700nm .
-

FRQ 3: Graphs, Stopping Potential, and Compton Effect — 8 marks

A student studies the photoelectric effect for a metal and obtains a straight-line graph of KE_{max} versus incident light frequency.

- a. What does the slope of the graph represent?
 - b. What does the x -intercept represent?
 - c. What does the y -intercept represent?
 - d. The stopping potential is measured to be 5.1V. Calculate the maximum kinetic energy in eV and joules.
 - e. An X-ray photon scatters from an electron in a Compton effect experiment. Explain how the wavelength and energy of the scattered photon compare with those of the incident photon.
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End of Part 1

A	
B	
C	
D	

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مع تمنياتي بالنجاح و التوفيق

أ/ أدهم زوين