2. Ahli fizik *X* telah menggabungkan teori Albert Einstein dan Max Planck dengan teori atom Rutherford. Siapakah ahli fizik *X*?
Physicist X combines the theories of Albert Einstein and Max Planck with Rutherford's atomic theory. Who is the physicist X?

A Thomas Young
B Louis de Broglie
C John Dalton
D Niels Bohr

3. Pilih padanan yang betul mengenai ahli fizik berikut dengan teori masing-masing?
Choose the correct match about the following physicists and their theories?

	Ahli fizik *Physicist*	Teori *Theory*
A	Isaac Newton	Penemuan elektron *Discovery of electron*
B	J.J. Thomson	Cahaya terdiri daripada zarah *Light consist of particles*
C	Thomas Young	Idea kuanta tenaga *Idea of quantum of energy*
D	Louis de Broglie	Sifat kedualan gelombang-zarah *Wave-particle duality properties*

4. Penemuan hebat Max Planck adalah tenaga radiasi dibebaskan dalam bentuk paket yang dikenali sebagai
Max Planck's great discovery is that the radiation energy is released in the form of a packet known as

A foton/ *photons*
B kuantum/ *quantum*
C sinar gamma/ *gamma ray*
D elektron/ *electron*

5. Apakah yang dimaksudkan dengan foton?
What is meant by photon?

A Zarah yang bercas positif
Positively charged particle
B Kuantum tenaga bagi sinar gelombang elektromagnet
Quantum of energy of electromagnetic radiation
C Unit bagi tenaga
Unit for energy
D Zarah yang bercas negatif
Negatively charged particle

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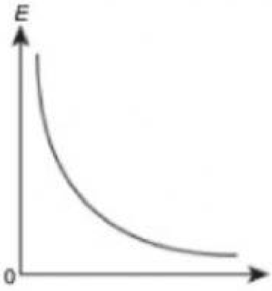
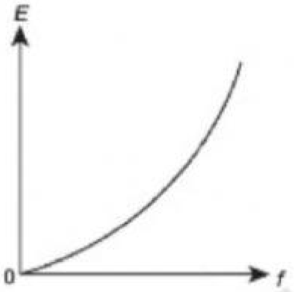
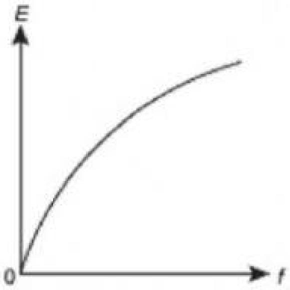
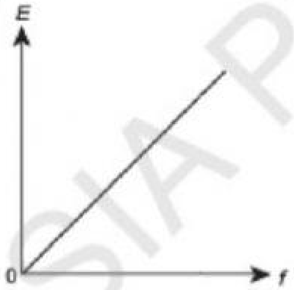
6. Graf manakah menunjukkan perubahan tenaga E dari cahaya foton dengan frekuensi gelombang, f?
Which of the following graphs shows the energy change, E of the photon light with frequency, f ?

A


C


B


D


7. Berikut adalah tiga tenaga dari sumber berbeza.
The following are three energies from different sources.

P – tenaga foton gelombang radio
photon energy of radio wave
Q – tenaga foton sinar cahaya nampak
photon energy of visible light
R – tenaga foton sinar gamma
photon energy of gamma ray

Urutan manakah yang mempunyai tenaga dalam turutan menurun?
Which sequence has the energy in descending order?

KBAT Menganalisis

A RQP
B PQR
C QRP
D PRQ

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8. Rajah 8 menunjukkan dua jenis mikroskop.
Diagram 8 shows two types of microscopes.

Rajah/*Diagram* 8

Antara berikut yang manakah benar tentang mikroskop *X* dan *Y*?
Which of the following is true about X and Y microscopes?

A Kos mikroskop *X* lebih tinggi daripada *Y*.
Cost of microscope X is higher than Y.

B Mikroskop *X* menggunakan sumber elektron manakala mikroskop *Y* menggunakan sumber cahaya.
Microscope X uses electron source while microscope Y uses light source.

C Mikroskop *X* mempunyai resolusi yang lebih rendah daripada *Y*.
Microscope X has lower resolution than microscope Y.

D Mikroskop *X* mempunyai resolusi yang lebih tinggi daripada *Y*.
Microscope X has higher resolution than microscope Y.

11. Satu elektron mempunyai laju v dan panjang gelombang de Broglie λ. Jika laju elektron meningkat kepada $4v$, hitungkan panjang gelombang de Broglie yang baru.
An electron has a velocity v and a de Broglie wavelength λ. If the electron speed increased to 4v, calculate the new de Broglie wavelength.

A $\frac{\lambda}{2}$

B $\frac{\lambda}{4}$

C 2λ

D 4λ

12. Dalam sinar laser, setiap foton mempunyai tenaga 1.2 eV. Berapakah panjang gelombang, λ (dalam nm) bagi setiap foton yang dipancarkan oleh laser?
In a laser beam, each photon has an energy of 1.2 eV. What is the wavelength, λ (in nm) for each photon emitted by the laser?

A 589 nm
B 1657 nm
C 1036 nm
D 468 nm

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