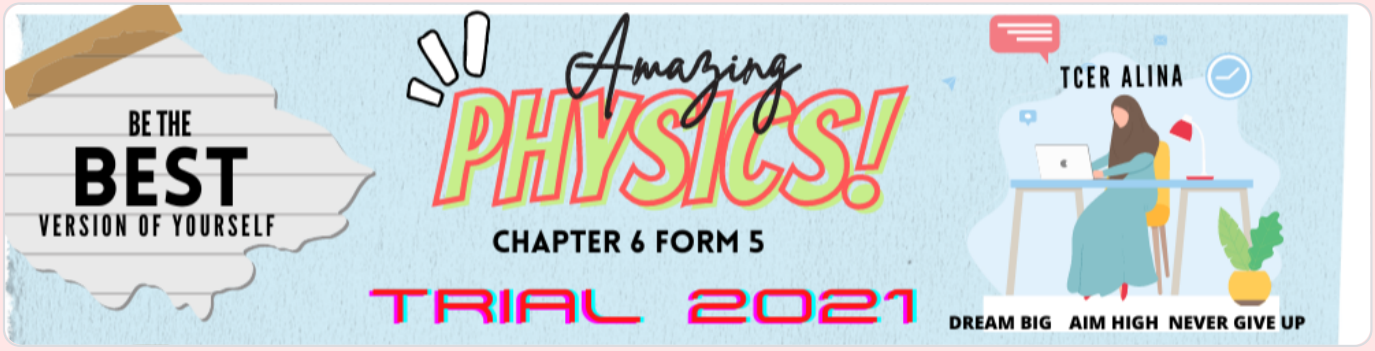


CHAPTER 6 F5: NUCLEAR PHYSICS

Physics trial questions 2021 by chapter.
amazing Physics with Tcer Alina

@Alina82

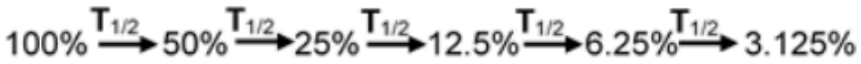
*Required

SCHOOL *

Choose

1. 1 point

Aktiviti sampel P menjadi 3.125 % daripada nilai asal selepas 200 minit.
The activity of sample P *becomes* 3.125 % *from its original value after* 200 *minutes.*



Berapakah separuh hayatnya?
What is its half-life?

A 30 minit
30 *minutes*

B 40 minit
40 *minutes*

C 50 minit
50 *minutes*

D 100 minit
100 *minutes*

- ○ A
- ○ B
- ○ C
- ○ D

2. 1 point

Jumlah tenaga yang besar dibebaskan semasa dua nukleus yang ringan bergabung membentuk satu nukleus yang berat. Apakah nama proses ini?
A large amount of energy is released when two light nuclei combine to form a heavy nucleus. What is the name of this process?

A Tindak balas nuclear
Nuclear reaction

B Pelakuran nuklear
Nuclear fusion

C Pembelahan nuclear
Nuclear fission

D Tindak balas berantai
Chain reaction

- ○ A
- ○ B
- ○ C
- ○ D

3. 1 point

Diagram 23 shows a graph of activity against time for a radioactive element.

Rajah 23 menunjukkan graf aktiviti melawan masa bagi satu elemen radioaktif.

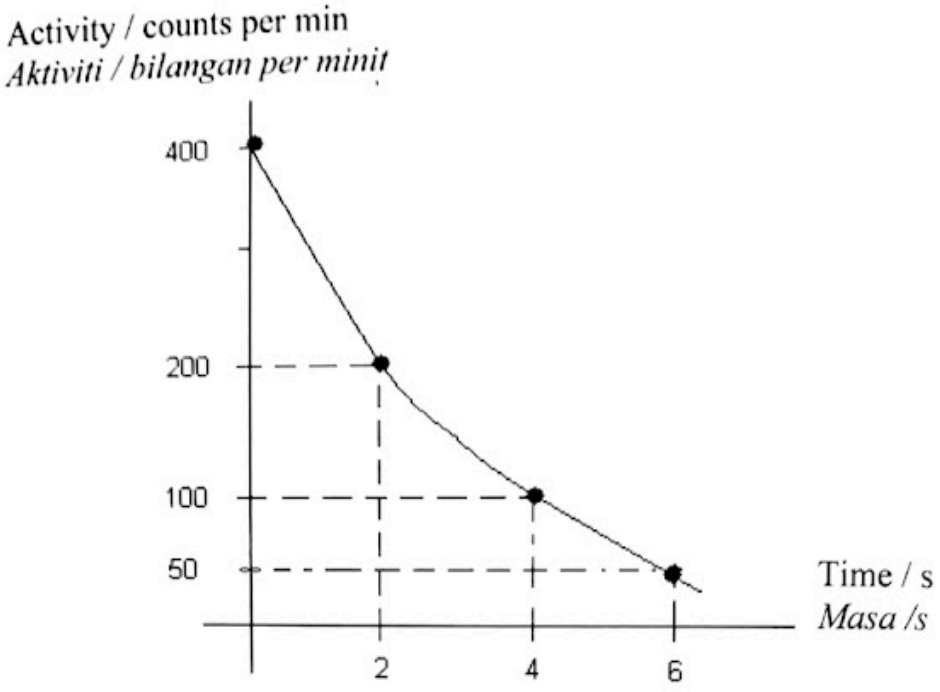


Diagram 23

Rajah 23

How many half-life has the element gone through after 6 minutes?

Berapakah bilangan separuh hayat yang telah dilalui elemen itu setelah 6 minit ?

A one / *satu*

B two / *dua*

C three / *tiga*

D four / *empat*

- A
- B
- C
- D

4. 1 point

A radioactive decay is represented by
Reputan radioaktif diwakili oleh

$$^{212}_{84}Po \rightarrow {}^{A}_{Z}X + 2\,{}^{4}_{2}He$$

Determine the values of A and Z for the nucleus X.

Tentukan nilai A *dan* Z *untuk nukleus* X.

	A	Z
A	208	80
B	204	86
C	220	86
D	204	80

- A
- B
- C
- D

5. 1 point

Which of the following nuclear reactions is an example of fusion?

Antara tindak balas nuklear berikut, yang manakah contoh pelakuran nuklear?

A $^{239}_{94}Pu + ^{1}_{0}n \rightarrow ^{144}_{58}Ce + ^{93}_{36}Kr + 3^{1}_{0}n$

B $^{210}_{84}Po \rightarrow ^{206}_{82}Pb + ^{4}_{2}He + \gamma$

C $^{2}_{1}H + ^{3}_{2}He \rightarrow ^{4}_{2}He + ^{1}_{1}H$

D $^{211}_{82}Pb \rightarrow ^{211}_{83}Bi + ^{0}_{-1}e + \gamma$

- ○ A
- ○ B
- ○ C
- ○ D

6. 1 point

Persamaan berikut mewakili reputan nukleus Polonium.
The following equation represents the decay of the Polonium nucleus.

$$^{210}_{84}\mathrm{Po} \rightarrow {}^{206}_{82}\mathrm{Pb} + \boxed{\mathrm{X}}$$

Apakah yang diwakili oleh X?
What is represented by X ?

A Sinar gama
Gamma ray
B Zarah beta
Beta particle
C Zarah alfa
Alpha particle
D Sinar-X
X-ray

- A
- B
- C
- D

7. 1 point

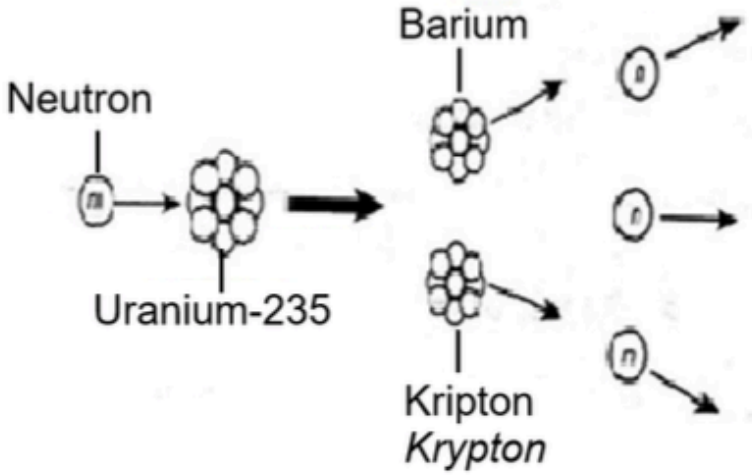
Dalam satu tindakbalas nukleus ,tenaga 2.69 x 10^{-12} J dibebaskan. Berapakah cacat jisim?
In a nuclear reaction 2.69 x 10^{-12} J *of energy is released. What is the mass defect ?*

A 8.97 x 10^{-12} kg
B 8.97 x 10^{-21} kg
C 2.99 x 10^{-11} kg
D 2.99 x 10^{-29} kg

- A
- B
- C
- D

8. 1 point

Rajah 22 menunjukkan satu tindak balas nukleus.
Diagram 22 shows a nuclear reaction.



Rajah 22
Diagram 22

Tindak balas tersebut ialah
The reaction is

A pelakuran nukleus
nuclear fusion

B pembelahan nukleus
nuclear fission

C reputan radioaktif
radioactive decay

- A
- B
- C

9. 1 point

Radium-226 decays by emitting alpha particle.

$$^{226}_{88}Ra \rightarrow {}^{222}_{86}Rn + {}^{4}_{2}He$$

What is the amount of energy released through this nuclear reaction?
[Ra-226 = 226.02536 a.m.u, Rn-222 = 222.01753 a.m.u, He-4 = 4.00260 a.m.u, 1 a.m.u = 1.66×10^{-27} kg, c = 3.00×10^{8} ms^{-1}]

A 8.68×10^{-30} J

B 2.60×10^{-21} J

C 4.71×10^{-14} J

D 7.81×10^{-13} J

- ○ A
- ○ B
- ○ C
- ○ D

10. 1 point

Diagram 30 shows a curve graph for radioactive decay for a substance.

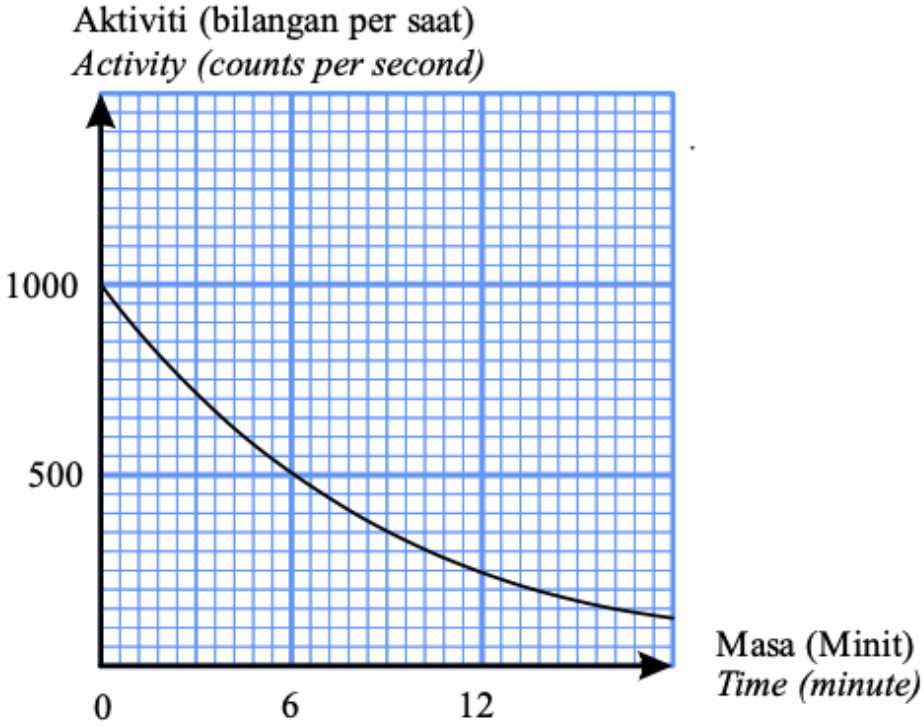


Diagram 30

What is the activity of the sample after 30 minutes?

A 31.25 **C** 125.00

B 62.50 **D** 250.00

- A
- B
- C
- D

11. 1 point

Radioactive source X emits γ – rays.
Which is the most effective precaution to reduce the risk when handling, storing, or using the radioactive source X?

A Handle X at the open space.

B Use forceps when handling X.

C Store X in thick plastic container.

D Have a fire extinguisher nearby when using X.

- A
- B
- C
- D

12. 1 point

Antara berikut yang manakah tindak balas pelakuran?
Which of the following is a fusion reaction?

A $^{2}_{1}H + ^{2}_{1}H \rightarrow ^{3}_{2}He + ^{1}_{0}n + E$

B $^{226}_{88}Ra \rightarrow ^{222}_{86}Rn + \alpha + E$

C $^{21}_{11}Na \rightarrow ^{21}_{12}Mg + \beta + E$

D $^{239}_{92}U \rightarrow ^{95}_{38}Sr + ^{141}_{54}Xe + 3^{1}_{0}n + E$

- A
- B
- C
- D

13. 1 point

32 mg satu unsur radioaktif X yang setengah hayatnya 5 minit dimasukkan ke dalam satu bekas tertutup pada $t = 0$ minit. Selepas 10 minit, 4 mg unsur radioaktif X ditambah ke dalam bekas itu. Berapakah jisim unsur radioaktif X yang tinggal di dalam bekas itu pada $t = 15$ minit?

32 mg *of a radioactive element* X *with a half-life of* 5 *minutes was placed in a closed container at* $t = 0$ *minute. After* 10 *minutes,* 4 mg *of radioactive element* X *was added to the container. What is the mass of radioactive element* X *remaining in the container at* $t = 15$ *minutes?*

A 2 mg

B 4 mg

C 6 mg

D 8 mg

- A
- B
- C
- D

14. 1 point

Berikut adalah keterangan satu tindak balas nukleus.
Below is the description of a nuclear reaction.

- Kombinasi dua nukleus ringan untuk membentuk satu zarah berat
  Combination of two lighter nuclei to form a heavier nucleus
- Membebaskan tenaga yang amat banyak
  Releases an enormous amount of energy
- Berlaku pada suhu dan tekanan yang sangat tinggi
  Occurs at extremely high temperature and pressure

Apakah nama tindak balas nukleus yang dinyatakan di atas?
What is the name of the nuclear reaction described above?

A Pelakuran nukleus
Nuclear fusion
B Tindak balas berantai
Chain reaction
C Pembelahan nukleus
Nuclear fission
D Tindak balas eksotermik
Exothermic reaction

- ○ A
- ○ B
- ○ C
- ○ D

15. 1 point

Satu nukleus X dihasilkan oleh $^{230}_{91}Z$. Nukleus Z mengeluarkan satu zarah alfa, α dan kemudian satu zarah beta, β.

A nuclide X is represented by $^{230}_{91}Z$. It emits one alpha, α particle and then one beta, β particle.

Apakah nuklid X?

What is the Nuclide X?

A $^{226}_{88}X$

B $^{226}_{89}X$

C $^{226}_{90}X$

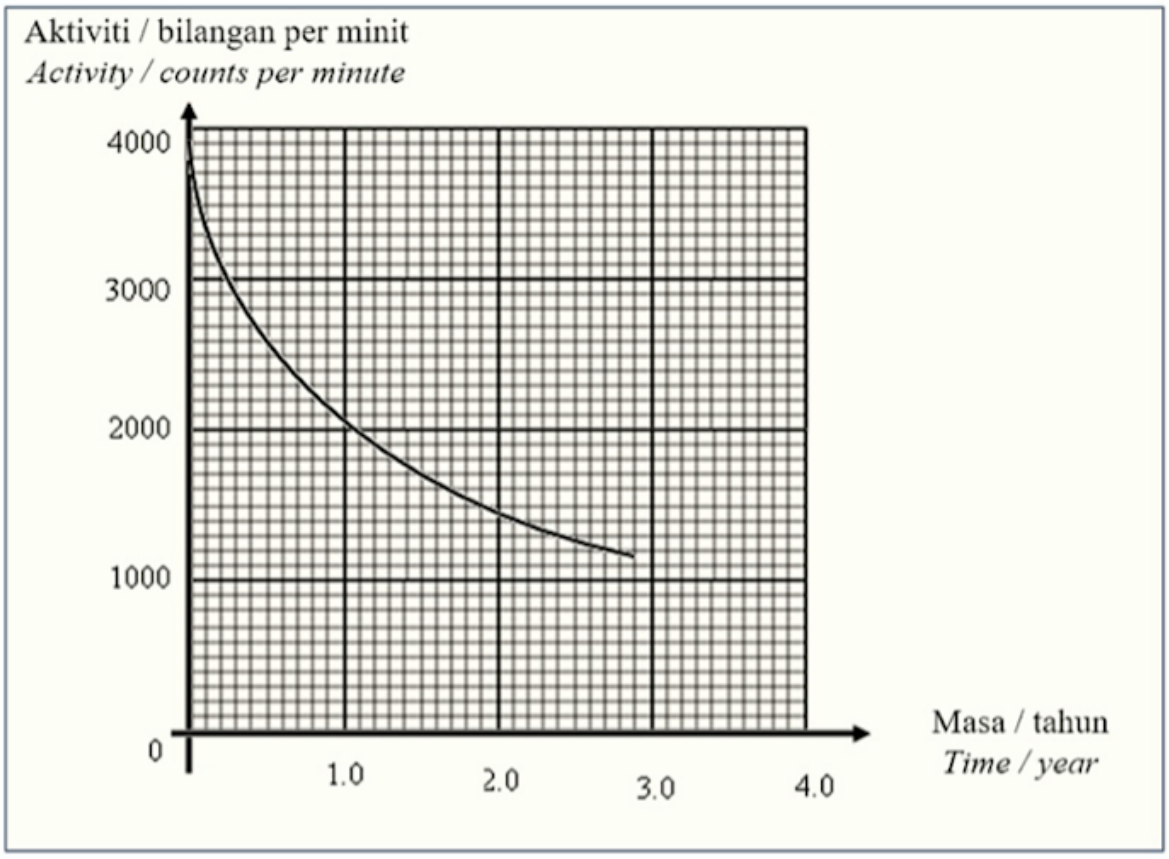
D $^{230}_{89}X$

- A
- B
- C
- D

16. 1 point

Rajah 25 menunjukkan lengkung reputan bagi satu sampel radioaktif.

Diagram 25 shows the decay curve of a radioactive sample.



Rajah 25
Diagram 25

Berapakah separuh hayat bagi sampel radioaktif tersebut?

What is the half life of the radioactive sample?

A 0.2 tahun
0.2 years

B 0.4 tahun
0.4 years

C 1.0 tahun
1.0 years

D 1.2 tahun
1.2 years

A

B

C

D

17. 1 point

Apabila satu sampel Radium-226 mereput, tenaga yang dibebaskan ialah 7.81×10^{-13} J. Berapakah cacat jisim?

When a sample of Radium-226 decays, the energy released is 7.81×10^{-13} J. What is the mass defect?

A 8.68×10^{-30} kg

B 2.60×10^{-21} kg

C 3.84×10^{20} kg

D 1.15×10^{29} kg

A

B

C

D

18. 1 point

Satu nukleus radioaktif mereput dengan membebaskan satu zarah α. Apakah perubahan-perubahan yang berlaku kepada nombor atom dan nombor nukleon?

A radioactive nucleus decays by emitting a particle. What changes occur in the atomic number and nucleon number?

	Nombor atom ***Atomic number***	**Nombor nukleon** ***Nucleon number***
A	Berkurang sebanyak 2 *Decreases by 2*	Berkurang sebanyak 2 *Decreases by 2*
B	Berkurang sebanyak 2 *Decreases by 2*	Berkurang sebanyak 4 *Decreases by 4*
C	Bertambah sebanyak 4 *Increases by 4*	Bertambah sebanyak 4 *Increases by 4*
D	Bertambah sebanyak 1 *Increases by 1*	Tiada perubahan *No change*

- ○ A
- ○ B
- ○ C
- ○ D

19. 1 point

Proses yang membelah nukleus yang ringan serta menghasilkan tenaga yang besar dipanggil
The process of splitting a heavier nucleus into lighter nuclei by released of a large amount of energy is called

A Pelakuran nukleus
Nuclear fusion

B Pembelahan nukleus
Nuclear fission

C Reputan radioaktif
Radioactive decay

D Separuh hayat
Half life

- ○ A
- ○ B
- ○ C
- ○ D

20. 1 point

Persamaan berikut menunjukkan proses penyepaian uranium 238.

The following equation shows the process of disintegration of uranium 238.

$$^{238}_{92}U \rightarrow {}^{234}_{90}Th \rightarrow {}^{234}_{91}Pa \rightarrow {}^{234}_{92}U \rightarrow {}^{230}_{90}Th$$

Apakah sinar radioaktif yang dipancarkan bagi setiap peringkat?

What is the radioactive rays that are emitted at each stage?

A α, β, α, α

B α, γ, γ, β

C β, α, α, β

D α, β, β, α

- ○ A
- ○ B
- ○ C
- ○ D

21. 1 point

Apakah yang dipancarkan oleh nukleus $^{234}_{90}Th$ apabila mereput menjadi nukleus yang lebih stabil, $^{234}_{91}Pa$?
What is emitted by the nucleus $^{234}_{90}Th$ when it decayes to be a more stable nucleus, $^{234}_{91}Pa$?

A zarah proton
proton particle

B nukleus helium
helium nucleus

C gelombang elektromagnet
electromagnetic wave

D elektron berkelajuan tinggi
high speed electron

- A
- B
- C
- D

22. 1 point

Tenaga sebanyak 2.5016×10^{-11} J telah dihasilkan dari pembelahan nukleus Uranium-235. Hitung cacat jisim yang terlibat dalam proses pembelahan nukleus itu dalam unit u.j.a.

[Laju cahaya dalam udara/vakum, $c = 3 \times 10^{8}$ m s^{-1} dan 1 u.j.a = 1.66×10^{-27} kg]

An energy of 2.5016×10^{-11} J *was generated from the fission of the Uranium-235 nucleus. Calculate the mass defects involved in the process of nuclear fission in unit of* a.m.u.

[*The speed of light in air/vacuum,* $c = 3 \times 10^{8}$ m s^{-1} *and* 1 a.m.u = 1.66×10^{-27} kg]

A 0.138424
B 0.153805
C 0.167446
D 0.186054

- A
- B
- C
- D

23. 1 point

Table 2 shows record of radioactive activity of sample X stored in a laboratory.
Jadual 2 menunjukkan rekod aktiviti radioaktif bagi sampel X yang disimpan di sebuah makmal.

Time / day *Masa / hari*	0	10	20	30
Activity / s^{-1} *Aktiviti / s^{-1}*	2000	500	125	Y

Table 2
Jadual 2

What is the value of Y?
Berapakah nilai Y?

A 7.810 **B** 15.625

C 31.250 **D** 62.500

- A
- B
- C
- D

24. 1 point

Rajah 37 menunjukkan siri pereputan radioaktif.
Diagram 37 shows a series of radioactive decay.

$$^{218}_{84}Po \rightarrow {}^{214}_{82}Pb \rightarrow {}^{214}_{83}Bi \rightarrow {}^{214}_{84}Po \rightarrow {}^{210}_{82}Pb$$

Rajah 37
Diagram 37

Tentukan sinar radioaktif yang dipancarkan dalam setiap peringkat siri pereputan di atas?
Determine the radioactive rays that are emitted in each stage of the above series of decay?

A β, γ, γ, β
B β, α, α, β
C α, α, β, β
D α, β, β, α

- ○ A
- ○ B
- ○ C
- ○ D

25. 1 point

Dalam sesebuh reaktor nuklear, kadar tindak balas berantai dikawal oleh.
In a nuclear reactor, the rate of chain reaction is controlled by

A Rod uranium
Uranium rods

B Rod boron
Boron rods

C Teras grafit
Graphite core

D Pengadang konkrit
Concrete shield

- A
- B
- C
- D

26. 1 point

Dalam suatu tindak balas pembelahan, 0.09% daripada jisim uranium-235 ditukarkan kepada tenaga. Hitungkan tenaga yang dibebaskan apabila 1 g uranium-235 dibelahkan di dalam sebuah reactor nuklear.
In a fission reaction, 0.09% of the mass of uranium-235 is changed to nuclear energy. Calculate the energy released when 1 g of uranium-235 is fissioned in a nuclear reactor.
[Laju cahaya, $c = 3 \times 10^8$ m s^{-1}]
[*Speed of light*, $c = 3 \times 10^8$ m s^{-1}]

A 2.7×10^2 J

B 2.7×10^5 J

C 8.1×10^{10} J

D 8.1×10^{15} J

- A
- B
- C
- D

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