

University Hamma Lakhdar of El Oued,

Faculty of Exact Sciences

First Year Master Physics- Medical physics / 2021-2022/

name:	Family name:	Time= 1 Hour
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### Correction Technical English Exam

**Alpha decay:** a nucleus emits a particle consisting of two protons and two neutrons. Such an alpha particle will collide with molecules in the air, pick up two electrons and become a Helium atom.

**Beta decay:** here a nucleus emits an electron. This is strange, since there are no electrons in the nucleus. Instead due to the weak force a neutron is transformed into a proton and an electron.

**Gamma rays:** both decay forms above transform a nucleus to a nucleus of lower energy. The excess energy is emitted in form of a high energy gamma ray photon, similar to the emission of radiation when electrons take on a different quantum state. The most important feature of a nucleus is its half-life that is the time after which half of a large collection of nuclei have decayed. Because some nuclei are much more stable than others different isotopes have widely different half-lives.

Example: The radioactive carbon isotope  $^{14}\text{C}$  has a half-live of 6000 years. Assume you have one gram of  $^{14}\text{C}$ . After 6000 years half of the carbon atoms will have beta-decayed to  $^{14}\text{N}$ , the stable form of Nitrogen, so you will have half a gram left. After another 6000 years half of those atoms will have decayed so that you are left with 1/4 gram of  $^{14}\text{C}$ .

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**Read carefully the text above and answer the questions below:**

1- Translate the underline words in the text to Arabic. (4 pts)

pick up = تلتقط

المشعة = The radioactive

نصف العمر = half-life

النواة = the nucleus

2- Linguistic competency:

- Give the equivalent in Arabic of the terms listed below: (10 pts)

The human body = جسم الإنسان	radiation risk = خطر الإشعاع
the skeletal = الهيكل العظمي =	Homeostasis = التوازن
decay paths = مسارات الاضمحلال	spectral lines = الخطوط الطيفية =
radioactive emissions = الانبعاثات المشعة =	scattering = التشتت =
radioactive waste = النفايات المشعة =	endocrine = الغدد الصماء =

- Fill in the gaps with the following words: (3 pts)  
*Atmosphere, carbon, Biological*

*Biological* tissue consists of bio-molecules, all of which have high *carbon* content. All of this carbon comes originally from the *atmosphere*. In the atmosphere  $^{14}\text{C}$  continuously decays and is replenished so that the ratio of carbon 14 to stable carbon remains 1 in 1 trillion.

- Translate in Arabic the below paragraph: (3 pts)

Human life process includes organization, metabolism, responsiveness, movements, reproduction, growth, differentiation, respiration, digestion, and excretion. All these processes work together, in fine-tuned balance, for the well-being of the individual and to maintain life.

تشمل عملية حياة الإنسان التنظيم، و التمثيل الغذائي، والاستجابة، والحركات، والتكاثر، والنمو، والتمايز، والتنفس، والهضم، والإفراز. تعمل كل هذه العمليات معاً، في توازن دقيق، من أجل رفاهية الفرد والحفاظ على الحياة.