المركز التربوي للبحوث والإنماء	الهيئة الأكاديميّة المشتركة قسم: اللغة الإنكليزية وآدابها	المادة : لغة إنكليزية الشهادة : الثانوية العامة فرعا : العلوم العامة وعلوم الحياة نموذج : رقم (1) المدّة : ساعتان ونصف

نموذج مسابقة (يراعي تعليق الدروس والتوصيف المعدّل للعام الدراسي 2016-2017 وحتى صدور المناهج المطوّرة)

Part One: Reading Comprehension **(Score: 24 /40)**

Read the selection below about the use of medical imaging for diagnosis and treatment of diseases and then answer the questions that follow.

Medical Imaging

1 Medical imaging has led to improvements in the diagnosis and treatment of numerous medical conditions in children and adults. There are many types – or modalities – of medical imaging procedures, each of which uses different technologies and techniques. Computed tomography (CT), fluoroscopy, and radiography (conventional X-ray), all use ionizing radiation to generate images of the body. Ionizing radiation is a form of radiation that can cause damage to DNA and may **elevate** a person's lifetime risk of developing cancer. CT, radiography, and fluoroscopy all work on the same basic principle: an X-ray beam is passed through the body where some X-rays are either absorbed or scattered by the internal structures, and the remaining X-ray pattern is transmitted to a detector (e.g., film or a computer screen) for recording or further processing by a computer.

2 Many people consider the discovery of X-rays and the invention of CT major advances in medicine. X-ray imaging exams are publically recognized as a valuable medical tool for a wide variety of procedures because they noninvasively and painlessly help in the diagnosis of diseases and in monitoring therapy**.**

3 As in many aspects of medicine, there are risks associated with the use of X-ray imaging, which uses ionizing radiation to take images of the body. Risks from exposure to ionizing radiation include a small increase in the possibility that a person exposed to X-rays will develop cancer with age. <u>They</u> also include tissue effects as in the case of cataracts, skin reddening, and hair loss, which **occur** at relatively high levels of radiation exposure and are rare for many types of imaging exams. Although the typical use of a CT scanner or conventional radiography equipment should not result in tissue effects, the dose to the skin from some complex interventional fluoroscopy procedures for a long time might, in some circumstances, be high enough to result in such effects. Another risk of X-ray imaging is possible reactions associated with an intravenously injected contrast agent, or "dye", that is sometimes used to improve visualization.

4 While the benefits of a clinically appropriate X-ray imaging exam generally far **outweigh** the risks, efforts should be made to minimize the risks by reducing unnecessary exposure to ionizing radiation. To help reduce risks to the patient, all exams using ionizing radiation should be performed only when necessary to answer a medical question, treat a disease, or guide a procedure. If there is a medical need for a particular imaging procedure and other exams with no radiation are less appropriate, then the benefits are more than the risks. In this case, radiation risk considerations

should not influence the physician's decision to perform the study or the patient's decision to have the procedure.

5 Patient factors are important to consider in this balance of benefits and risks. For example, because younger patients are more sensitive to radiation, special care should be taken to **reduce** radiation exposure to pediatric patients for all types of X-ray imaging exams. Special care should also be taken in imaging pregnant patients due to possible effects of radiation exposure to the developing fetus they carry. The benefits of possible disease detection should be carefully balanced against the risks of an imaging screening study on healthy and symptomatic patients. It is important to note as well that there is considerable overlap between the sizes of larger pediatric and smaller adult patients. It is the patient's size that determines the dose needed for an optimal image for a particular indication. For example, based on a National Health Statistics report, a very small U.S. adult female is similar in size to an average twelve-year-old child (male or female of similar size). If the same X-ray imaging exam is performed on adult and pediatric patients of the same size, the imaging parameters should be similar for both patients. X-ray imaging (CT, fluoroscopy, and radiography) exams should be performed only after careful identification of the patient's health needs. They should be performed only when the referring physician judges them to be necessary.

6 While the referring physician has the primary responsibility for justification and the imaging team has the primary responsibility for exam optimization, communication between the referring physician and imaging team can help **ensure** that the patient receives an appropriate exam at an optimal radiation dose. Physicians should become educated about radiation safety principles and how to communicate them to patients. They should also discuss the reason for the examination with the patients to make sure they understand the benefits and risks.

Questions:

A- Answer each of the following questions in 1- 3 complete sentences using your own words.

1- Based on paragraph 2, how can you best describe the public perceptions about X-ray? Justify. **(Score: 01)**

2- What is the main idea of paragraph 4? **(Score: 01)**

3- Based on paragraphs 4 and 5, what adjective best describes the writer's attitude towards using medical imaging? Justify**.** **(Score: 02)**

4- Based on paragraph 6, what conclusion can be drawn about the use of radiation? **(Score: 02)**

5- Based on the indicated paragraphs, what does each of the following pronouns refer to? **(Score: 01)**

a- They (Paragraph 3) b-They (Paragraph 5)

B- Indicate whether the following statements are TRUE or FALSE and then correct the false ones. **(Score: 03)**

1- In fluoroscopy procedure, a low level of radiation dose for a few minutes always results in tissue effects.

2- Damage to DNA and the possibility of having cancer increase with increased exposure to ionizing radiation.

3- Even if X-ray imaging exam is performed on an adult and a young patient of different size, the imaging parameters should be the same for both.

C-

1- What is the thematic relationship between paragraphs 2 and 3? Explain. **(Score: 01)**
2- What is the writer's purpose in writing this selection? Justify. **(Score:01)**
3- What is the pattern of organization in paragraph 3? Explain. **(Score: 01)**
4- The following is a poor version of a one-sentence summary of paragraph 5. Rewrite it correctly**.** **(Score: 02)**

Poor version: *Patient factors are important because young and pregnant patients are sensitive to radiation.*

D- The table below shows the percentages of cancer incidence by age and level of radiation exposure. Read the table carefully and then answer the following question. **(Score: 04)**

Percentages of Cancer Incidence by Age and Level of Radiation Exposure

Age group / **Radiation exposure level**	**1-9 years**	**10-19 years**	**20-29 years**
Low level	10 %	7%	5%
High level	18%	13%	10%

What do the percentages indicate about the relationship between age and level of radiation exposure? Explain with evidence.

E- The reading selection has six paragraphs 1→6. Each of the following extracts (A and B) is the correct ending of ONE paragraph in the selection. Read extracts A and B carefully and then choose from paragraphs (1→6) the one that correctly fits with each extract. **(Score: 01)**

Extract A- *Besides, imaging teams should receive training on radiation safety issues for particular equipment used at their facility, in addition to basic continuing education on this topic.*

Extract B-. *They are also supportive in medical and surgical treatment planning and a reliable guide for medical personnel as they insert devices inside the body to treat tumors or remove blood clots or other blockages.*

F- Use contextual clues to figure out the meaning of each word in the box below. Then fill in the blanks with the correct words to complete the following sentences. **(Score: 04)**

elevate (Paragraph 1)	**occur** (Paragraph 3)	**outweigh** (Paragraph 4)
reduce(Paragraph 5)	**ensure** (Paragraph 6)	

1- The crime scene scared the detective and made his heartbeat _____ and his body sweat.
2- The manager believes that although the costs of this project are very high, the profits our company will make out of it _____ its costs.
3- All members promised to do everything within their power to _____ that the conference will be successful.
4- Car accidents mainly _____because of lack of attention on the part of the driver.

Part Two: Writing **(Score: 16/40)**

Choose ONE of the following prompts:

Prompt (A): Read the following statement from a report on the risk factors of using radiation.

Although there are countless areas where the power of radiation has been used for the benefit of mankind in medicine and industry and other fields of science, it has many negative effects on human beings and the environment. Therefore, the use of radiation should be reduced to preserve our planet even if progress in different areas of science will be slowed down.

Write an argumentative essay in which you argue *for* or *against* the above statement. As you develop your essay, support your position by drawing on logical reasoning and experience. In your supporting paragraphs provide relevant, specific, and adequate evidence and examples from your reading, experience or observation. Your essay should be between 250-300 words with an appropriate title. Revise and proofread your essay.

Prompt (B)*:* Read the following statement from an article on medical technology.

There have been many new advancements in medicine due to technology. Researchers and scientists are empowered by computers and other technologies to come up with new solutions to medical problems, and doctors now effectively use technology in surgeries and medical treatment.

Write an essay in which you explain the above statement. As you develop your essay, refer to the positive impact of technology on medicine and health care .Explain how technology has helped doctors in the diagnosis and cure of diseases as well as in patient services.

In your essay, provide a thesis statement in the introduction, a topic sentence in each body paragraph and support the main idea with relevant, specific and adequate details. Give examples drawn from your reading, experience or observation. Your essay should be between 250-300 words with an appropriate title. Revise and proofread your essay.

Your essay will be evaluated based on content and organization of ideas (Score: 07), language and style (Score: 07), tidiness and handwriting (Score: 02).

المركز التربوي للبحوث والإنماء	الهيئة الأكاديميّة المشتركة قسم: اللغة الإنكليزية وآدابها	المادة : لغة إنكليزية الشهادة : الثانوية العامة فرعا : العلوم العامة وعلوم الحياة نموذج : رقم (1) المدّة : ساعتان ونصف

أسس التصحيح (تراعي تعليق الدروس والتوصيف المعدّل للعام الدراسي 2016-2017 وحتى صدور المناهج المطوّرة)

A-

1- The perceptions of the public are positive. People describe X- ray imaging as a major advance in medicine and as a valuable tool that is painless in diagnosis and therapy.
2- Balancing benefits and risks of imaging procedure reduces its risks.
3- The writer is cautious about the use of medical imaging. Beside referring to the benefits of imaging, the writer refers to the need to minimize the risks associated with it, balancing its risks and benefits in disease detection, taking special care to reduce exposure to it, and performing it only when necessary.
4- Physicians' communication with the imaging team and patients about the safe use of radiation is very important.
5- a-"They" in paragraph 3 refers to ionizing radiation risks.
b- "They" in paragraph 5 refers to X-ray imaging exams.

B-

1- False statement
Correct statement: In fluoroscopy procedure, a high level of radiation dose for a long time in some circumstances results in tissue effects.
2- True statement
3- False statement
Correct statement: When X-ray imaging exam is performed on an adult and a young patient of the same size, the imaging parameters should be the same for both.

C-

1- It is a relationship of contrast. In paragraph 2, the writer explains the advantages of X-ray imaging; whereas, in paragraph 3, the writer explains the risks of using it.
2- The writer's purpose is to inform the reader about the benefits and potential risks of medical imaging and how to make a balance between them.
3- It is a listing pattern of organization, the writer lists different kinds of risks using the words "include", "also" and "another".
4- To avoid the risks of X-ray imaging, the patient-related factors that should be taken into consideration are age, pregnancy, health condition and size.

D- The percentages indicate that cancer incidence caused by high level of radiation exposure exceeds that caused by low level of exposure for each age group. The percentage of high level exposure is 18% compared with 10% for ages 1-9, 13% compared with 7% for ages 10-19 and 10% compared with 5% for ages 20-29 years. On the other hand, cancer incidence decreases with the increase in age group for both levels of exposure. Age group 20-29 has the lowest percentage of 5% compared with 7% for ages 10-19 and 10% for ages 1-9 years for low level

of exposure. Likewise, age group 20-29 has the lowest percentage of 10% compared with 13% for ages 10-19 and 18% for ages 1-9 years for high level of exposure.

E- Extract A is the correct ending of paragraph 6**.**

Extract B is the correct ending of paragraph 2.

F-

1- elevate
2- outweigh
3- ensure
4- occur