

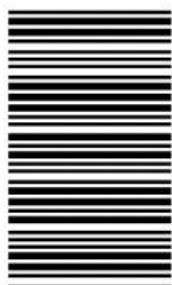
412

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نام:

نام خانوادگی:

محل امضا:



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صبح جمعه

۹۵/۱۲/۶

دفترچه شماره ۲ از ۲



جمهوری اسلامی ایران
وزارت علوم، تحقیقات و فناوری
سازمان سنجش آموزش کشور

«اگر دانشگاه اصلاح شود، مملکت اصلاح می‌شود.»

امام خمینی (ره)

آزمون ورودی
دوره‌های دکتری (نیمه‌متمرکز) داخل
سال ۱۳۹۶

کلیه رشته‌های امتحانی گروه آزمایشی فنی و مهندسی

مدت پاسخگویی: ۹۰ دقیقه

تعداد سؤال: ۶۰

عنوان مواد امتحانی، تعداد و شماره سؤال‌ها

ردیف	مواد امتحانی	تعداد سؤال	از شماره	تا شماره	ضریب
۱	استعداد تحصیلی	۳۰	۱۰۱	۱۳۰	۱
۲	زبان انگلیسی - عمومی	۳۰	۱۳۱	۱۶۰	۱

این آزمون نمره منفی دارد.

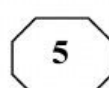
استفاده از ماشین حساب مجاز نیست.

اسفندماه - سال ۱۳۹۵

حق چاپ، تکثیر و انتشار سؤالات به هر روش (الکترونیکی و ...) پس از برگزاری آزمون، برای تمامی اشخاص حقیقی و حقوقی تنها با مجوز این سازمان مجاز می‌باشد و با متخلفین برابر مقررات رفتار می‌شود.



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بخش پنجم

راهنمایی:

این بخش، مربوط به سؤالات آزمون زبان انگلیسی - عمومی است.

PART A: GRAMMAR

Directions: Select the answer choice (1), (2), (3), or (4) that best completes the blank. Then mark the correct choice on your answer sheet.

- 131- In his *Physics*, concerned with the philosophical question of the nature of motion as one variety of change.
1) Aristotle who was primary 2) Aristotle was primarily
3) as Aristotle whose primary 4) that Aristotle was primarily
- 132- earlier discussions of the possibility of Earth's motion, the Polish astronomer Nicolaus Copernicus was the first to propound a comprehensive heliocentric theory.
1) Although there had been 2) Despite there were
3) Nevertheless, it had been 4) Even though they were
- 133- Not until optical instruments were sufficiently developed to reveal cells, possible to formulate a general hypothesis that satisfactorily explained how plants and animals are organized.
1) it was 2) that was it
3) was it 4) that it was
- 134- Toward the end of the 18th century on physiology became pronounced through Antoine Lavoisier's brilliant analysis of respiration as a form of combustion.
1) the influence of chemistry
2) it was the influence of chemistry
3) that it was the influence of chemistry
4) the influence of chemistry which
- 135- Many rocks have a more complex mineralogy, and in some the mineral particles they can be identified only through specialized techniques.
1) which are those so minute 2) are too minute that
3) which are too minute 4) are so minute that
- 136- The major plasma protein is serum albumin, a relatively small molecule, is to retain water in the bloodstream by its osmotic effect.
1) its principal function which 2) the principal function of which
3) that it principal function 4) whose its principal function

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147- For the first time Aunt Rachel thought about the fact that she had no toward her nephews at all, yet she had risked her life for them.

- 1) compliment
- 2) commitment
- 3) amendment
- 4) testament

148- It is important for a person in a leadership role to have and the knack for interacting with a large variety of people.

- 1) vivacity
- 2) diversity
- 3) immunity
- 4) prosperity

149- Adults love fairy tales as much as kids because it gives them the hope that even their own lives will be touched by magic one day.

- 1) legitimate
- 2) prevalent
- 3) dominant
- 4) mundane

150- I had to return the software back to the store because it was not with my computer.

- 1) compatible
- 2) plausible
- 3) eligible
- 4) ostensible

PART C: Reading Comprehension

Directions: Read the following two passages and select the choice (1), (2), (3), or (4) that best answers each question. Then mark the correct choice on your answer sheet.

Passage 1:

Any device that maintains blood circulation and oxygenation in the human body for varying periods of time is called an artificial heart. There are two main types: the heart-lung machine and the mechanical heart.

The heart-lung machine is a mechanical pump that maintains a patient's blood circulation and oxygenation during heart surgery by diverting blood from the venous system, directing it through tubing into an artificial lung (oxygenator), and returning it to the body. The first successful clinical use of a heart-lung machine was reported by American surgeon John H. Gibbon Jr. in 1953. During this operation for the surgical closure of an atrial septal defect, cardiopulmonary bypass was achieved by a machine equipped with an oxygenator developed by Gibbon and a roller pump developed in 1932 by American surgeon Michael E. DeBakey. Since then, heart-lung machines have been greatly improved with smaller and more efficient oxygenators, allowing them to be used not only in adults but also in children and even newborn infants.

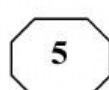
Mechanical hearts, which include total artificial hearts and ventricular assist devices (VADs), are machines that are capable of replacing or assisting the pumping action of the heart for prolonged periods without causing excessive damage to the blood components. Implantation of a total artificial heart requires removal of both of the patient's ventricles (lower chambers). However, with the use of a VAD to support either the right or the left ventricle, the entire heart remains in the body.

The first successful use of a mechanical heart in a human was performed by Michael E. DeBakey in 1966. After surgery to replace the patient's aorta and mitral valve, a left VAD was installed, making it possible to wean the patient from the heart-lung machine. After 10 days of pump flow from the VAD, the heart recovered, and the VAD was removed. During the 1970s synthetic materials were developed that greatly aided the development of

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permanent artificial hearts. One such device, designed by American physician Robert K. Jarvik, was surgically implanted into a patient by American surgeon William C. DeVries in 1982. The aluminum and plastic device, called the Jarvik-7 for its inventor, replaced the patient's two ventricles. Two rubber diaphragms, designed to mimic the pumping action of the natural heart, were kept beating by an external compressor that was connected to the implant by hoses. This first recipient survived 112 days and died as a result of various physical complications caused by the implant.

151- What does the second paragraph mainly discuss?

- 1) Why the first heart-lung machine turned out to be a success
- 2) What an oxygenator does during cardiopulmonary bypass
- 3) What a heart-lung machine is and how it works
- 4) When the first heart-lung machine was made

152- What does the word "it" in paragraph 2 refer to?

- 1) Venous system
- 2) Heart surgery
- 3) Pump
- 4) Blood

153- Which of the following statements is TRUE?

- 1) The first roller pump was made by John H. Gibbon Jr. in the 1930s.
- 2) The first successful use of a heart-lung machine occurred in the 1950s.
- 3) The first successful use of a mechanical heart was tested prior to the use of a heart-lung machine.
- 4) The first synthetic materials to develop permanent artificial hearts were designed by William C. DeVries.

154- The passage supplies sufficient information to answer which of the following questions?

I. How long did Michael E. DeBakey's patient continue to live after the surgery?

II. What did the first patient who received the Jarvik-7 die of?

III. Why is it necessary to wean the patients who receive a VAD from the heart-lung machine?

- 1) I and II
- 2) Only II
- 3) II and III
- 4) I, II, and III

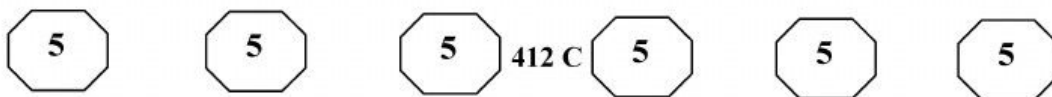
155- What does the word "mimic" in paragraph 4 mean?

- 1) Renew
- 2) Monitor
- 3) Imitate
- 4) Reinforce

Passage 2:

As he began to teach inorganic chemistry, Mendeleev could not find a textbook that met his needs. Since he had already published a textbook on organic chemistry in 1861 that had been awarded the prestigious Demidov Prize, he set out to write another one. The result was *Osnovy Khimii* ("The Principles of Chemistry", 1868-71), which became a classic, running through many editions and many translations. When Mendeleev began to compose the chapter on the halogen elements (chlorine and its analogues) at the end of the first volume, he compared the properties of this group of elements to those of the group of alkali metals such as sodium. Within these two groups of dissimilar elements, he discovered similarities in the progression of atomic weights, and he wondered if other groups of elements exhibited similar properties. After studying the alkaline earths, Mendeleev established that the order of atomic weights could be used not only to arrange the elements

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within each group but also to arrange the groups themselves. Thus, in his effort to make sense of the extensive knowledge that already existed of the chemical and physical properties of the chemical elements and their compounds, Mendeleev discovered the periodic law.

His newly formulated law was announced before the Russian Chemical Society in March 1869 with the statement "elements arranged according to the value of their atomic weights present a clear periodicity of properties." Mendeleev's law allowed him to build up a systematic table of all the 70 elements then known. He had such faith in the validity of the periodic law that he proposed changes to the generally accepted values for the atomic weight of a few elements and predicted the locations within the table of unknown elements together with their properties. At first the periodic system did not raise interest among chemists. However, with the discovery of the predicted elements, notably gallium in 1875, scandium in 1879, and germanium in 1886, it began to win wide acceptance. Gradually the periodic law and periodic table became the framework for a great part of chemical theory. By the time Mendeleev died in 1907, he enjoyed international recognition and had received distinctions and awards for his dedicated attempts from many countries.

156- Which of the following statements is TRUE?

- 1) Mendeleev used the order of atomic weights to arrange the elements both within and across the available groups.
- 2) Mendeleev became interested in organic chemistry when he started to write the chapter on the halogen elements.
- 3) Mendeleev completely rejected the extensive knowledge available on the chemical and physical properties discovered till then.
- 4) Mendeleev was awarded the Demidov Prize for the book he wrote on inorganic chemistry.

157- What does the word "exhibited" in paragraph 1 mean?

- | | |
|--------------|---------------|
| 1) Observed | 2) Stimulated |
| 3) Possessed | 4) Displayed |

158- What do we understand from paragraph 2?

- 1) The periodic law and periodic table became a widely recognized framework in the late 1860s.
- 2) Mendeleev's prediction about discovery of future elements and their locations in the periodic table came true.
- 3) The discovery of three more elements in the 1880s prompted Mendeleev to propose a new version of the periodic law.
- 4) The Russian Chemical Society had already arranged elements according to their atomic weights before Mendeleev's formulated law.

159- What does the word "it" in paragraph 2 refer to?

- | | |
|--------------|------------------------|
| 1) Interest | 2) Discovery |
| 3) Germanium | 4) The periodic system |

160- Which of the following best describes the tone of the passage?

- | | |
|-----------------|------------------|
| 1) Appreciative | 2) Disapproving |
| 3) Incredulous | 4) Hypercritical |

This is the end of Section 5.