

به نام خدا



دانشگاه صنعتی امیرکبیر
(پلی تکنیک تهران)

آزمون پذیرش دانشجوی دوره دکترای سال تحصیلی ۸۸-۸۷

آزمون شماره یک (درس زبان انگلیسی)

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توجه: این آزمون برای کلیه داوطلبان صرفنظر از رشته-گرایش آنان بطور یکسان و مشترک برگزار می‌گردد.

لطفاً اطلاعات زیر را براساس مندرجات کارت ورودی و پاسخنامه وارد نمایید:

شماره داوطلب:

نام:

نام خانوادگی:

هرگونه مغایرت در مندرجات کارت ورودی و اطلاعات پاسخنامه را به مراقبین حاضر در جلسه اعلام نمایید.



A. Grammar Section (Questions Q1 to Q20):

A.1 Directions for Questions 1 to 10:

Fill in the blanks with the most appropriate word or phrase.

Q1:

Synthetic polymers may be either thermoplastic or thermosetting depending _____ the action of tolylene disocyanate.

1. upon
2. of
3. in
4. with

Q2:

Marry wishes that she _____ law instead of history when she was in college.

1. studied
2. was studying
3. would study
4. could have studied

Q3:

If these waste chemicals _____ to enter the river, they would have poisoned it.

1. have been allowed
2. were allowed
3. were to be allowed
4. had been allowed

Q4:

Three responsibilities _____ are to search out, and assess patentable inventions and technologies.

1. on a patent
2. of a patent manager
3. with a patent manager
4. to a patent manager

Q5:

In the near future, the final mapping of the human genome _____ the range of medical treatments and cures available to those suffering from various diseases.

1. extends
2. will extend
3. will have extended
4. has extended

Q6:

The earth contains a _____ amount of uranium.

1. great
2. some
3. lot of
4. much

Q7:

_____, the students placed their pencils on their desks and left the room.

1. Being finished the test
2. Having finished the test
3. All the test now being over
4. Before the bell's ringing

Q8:

The sun can burn your skin _____.

1. if the sunshine is long
2. which has stayed long in the sunshine
3. if you stay long in the sunshine
4. which is in the sunshine

Q9:

The engine failed to reach its rated output, _____ tested.

1. when
2. such as
3. since
4. during

Q10:

Mars, _____, has been a source of human fascination for untold generations of sky-gazers.

1. the fourth planet from the Sun
2. it is the fourth planet from the Sun
3. which the fourth planet from the Sun it is
4. is it the fourth planet from the sun

A.2 Directions for Questions Q11 to Q20:

In this section, you will be given a sentence with four words or phrases underlined and with a letter in the parenthesis. One of the underlined words or phrases is NOT grammatically correct. You must find the INCORRECT ONE.

Q11:

Science is (A) the process of gathering (B) knowledge and answering questions (C) about the world and it's (D) phenomena.

1. A
2. B
3. C
4. D

Q12:

Electricity produced by nature (A) is called static (B) because it generates forceful (C) when it is stationary (D).

1. A
2. B
3. C
4. D

Q13:

As demand increases, manufacturers who previously produced (A) only a large, luxury car is (B) compelled to make (C) a smaller model in order to compete (D) in the market.

1. A
2. B
3. C
4. D

Q14:

The scientists had previously estimated (A) that age of that city is (B) ten million years; but now, by using a more modern dating method, they agree (C) that the age is closer (D) to six million years.

1. A
2. B
3. C
4. D

Q15:

A gas like propane will (A) combination (B) with water molecules in a saline solution to form (C) a solid called (D) hydrate.

1. A
2. B
3. C
4. D



Q16:

A mainframe computer is large and (A) is usually (B) used to operate (C) a network of others (D) computers.

1. A
2. B
3. C
4. D

Q17:

Nitrogen must be combine (A) with another element (B) such as (C) hydrogen to be useful (D) in agriculture or industry.

1. A
2. B
3. C
4. D

Q18:

The neutron bomb provided (A) the capability of a limiting (B) nuclear war in which buildings would be preserved (C) but people would be destroyed (D).

1. A
2. B
3. C
4. D

Q19:

New synthetic materials have improved (A) the construction (B) of artificial body parts by provide (C) both the power and the range of action for a natural limb (D).

1. A
2. B
3. C
4. D

Q20:

Nearly (A) all chemicals are harmful to (B) living tissues if enough of them (C) taken (D).

1. A
2. B
3. C
4. D



B. Vocabulary Section (Questions Q21 to Q40):

Directions for Question Q21 to Q40:

In each sentence, a word or phrase has been underlined. There are four other words or phrases below each sentence. You must select the one word or phrase which most closely matches the meaning of the underlined word.

Q21:

The sound of the modern instrument that has just been purchased by the company was almost inaudible.

1. very loud, easy to hear
2. very husky, easy to grasp
3. very soft, hard to hear
4. very strange, hard to grasp

Q22:

Computers are still used to store and manipulate data.

1. control differently
2. handle skillfully
3. operate oddly
4. signify strangely

Q23:

Rubber can be made from latex, the sap of a rubber tree. It can also be made synthetically by combining the chemical elements carbon and hydrogen.

1. superficially
2. practically
3. artificially
4. schematically

Q24:

The electromotive force induced in the circuit is proportional to the rate of change of flux.

1. flow
2. resistance
3. capacitance
4. direction

Q25:

The removal of cataracts in the eyes by laser has become a common procedure.

1. method
2. belief
3. performance
4. regulation



Q26:

Your research about corrosion trouble you have been getting in the control valve is a hard-working project.

1. eating
2. rusting
3. consuming
4. both "1" and "2"

Q27:

Specimens of bone are used for DNA typing.

1. Spots
2. Samples
3. Units
4. Discoloration

Q28:

The gravitational forces of the Sun and the Moon are fundamental in causing ocean tides.

1. obscure
2. essential
3. odd
4. current

Q29:

Sedatives calm a person without actually inducing sleep.

1. getting
2. subsiding
3. prolonging
4. causing

Q30:

Aluminum was produced in a mold to replicate a shape that resembles a barbell weight.

1. make a sandwich panel
2. inverse
3. make an exact shape
4. make an entire mold cavity

Q31:

Basalt industry conforms with environmental protection.

1. adopts
2. bounds
3. encounters
4. adapts



Q32:

Plastic foams with high level of porosity have attracted military specialists.

1. stiffness
2. rejection
3. efficiency
4. opening

Q33:

Metal foams have a relatively homogeneous and isotropic pore structures.

1. having the same form
2. having the same chemical property
3. having identical property
4. having the same physical property

Q34:

Some engineers have been criticized for placing too much emphasis on being on time.

1. importance
2. reluctance
3. substance
4. assistance

Q35:

The consequences of information technology have already pervaded our daily life.

1. penetrated
2. impregnated
3. fabricated
4. reinforced

Q36:

Integrated circuits are fabricated by this approach.

1. method
2. nearness
3. knowledge
4. trade

Q37:

Archaeologists very carefully dig down through the layers, keeping accurate records all the time.

1. original
2. important
3. precise
4. random

Q38:

Engineers are indispensable in a hospital.

1. useful
2. abundant
3. unique
4. imperative

Q39:

A special sizing agent provides sufficient integrity required for further processing of the material.

1. viscosity
2. entity
3. solidity
4. novelty

Q40:

Communications satellites have had the greatest effect on our daily lives. They have made it possible for live radio and television broadcasts to be carried around the world.

1. stations
2. locations
3. presentations
4. assertions

C. Translation Section (Questions Q41 to Q45):

Directions for Questions Q41 to Q45:

Find the most suitable translations of the given Farsi sentences that can convey the meaning of the sentences as closely as possible.

Q41:

بعد از سرد شدن فلز، ضروری است که آن را آبکاری کنید.

1. It is usual to cover the metal after it has chilled.
2. It is necessary to temperate the metal after it has quenched.
3. It is essential to temper the metal after it has quenched.
4. It is desirable to cover the metal after it has chilled.

Q42:

یکی از شیوه‌های دیگر (نمک‌زدایی آب) انجماد می‌باشد، که بر اساس نقاط انجماد متفاوت آب شیرین و شور پایه‌ریزی شده است. کریستال‌های یخ از آب نمک جدا شده و از نمک پاک می‌شود و بصورت آب شیرین ذوب می‌شود.

1. Freezing is an alternate method, based on the different freezing points of sweet and salt water. The ice crystals are analyzed from the salty-water, washed off of salt, and melted into sweet water.
2. Freezing is a substitute method, based on the different freezing points of fresh and salt water. The ice crystals are isolated from brine, washed off of salt, and melted into sweet water.
3. Freezing is another way, based on the different freezing points of fresh and salt water. The ice crystals are separated from the salt water, washed free of salt, and melted into fresh water.
4. Freezing is an alternate method, based on the different freezing points of fresh and salt water. The ice crystals are separated from the brine, washed free of salt, and melted into fresh water.

Q43:

هنگامی که نوترون‌ها ساطع می‌شوند، با سرعت بالایی حرکت می‌کنند و این موضوع شناخته شده است که چنین نوترون‌های سریعی شانس کمی دارند که توسط اورانیوم شکافت‌پذیر گرفتار یا جذب شوند. اما، اگر سرعت آنها به سرعت‌های حرارتی کاهش یابد، در این صورت احتمال گرفتار یا جذب شدن آنها به میزان زیادی افزایش می‌یابد.

1. When emitted, neutrons travel at a high velocity, and it is known that such fast neutrons have little chance of being captured by the fissile uranium. However, if slowed down to thermal speeds, their probability of capture is greatly increased.

2. When neutrons are emitted, neutrons travel fast, and it is common knowledge that with such a velocity their chances of being held by the fissile uranium are low. But, if they decrease their speed down to thermal ones, the possibility of being captured is highly enhanced.

3. While being given off, neutrons move quite fast, and it is well-known that these fast-moving species do not have high chances in being captured by fissile uranium. However, provided that they are slowed down to thermal velocities, the chances of being captured will be very high.

4. While emitted, neutrons cruise at a high velocity, and it is known that such fast-moving neutrons do not have high chances of being captured by the fissile uranium. But, if slowed down to thermal speeds, the possibility of being captured is augmented.

Q44:

بسیاری از مواد، هنگامی که در آب حل شوند، تجزیه می‌گردند، یعنی برخی از مولکول‌ها به ذرات باردار یا یون‌ها شکسته می‌شوند. برای مثال، نمک معمولی که در آب حل شده است، بطور جزئی به یون‌های سدیم با بار مثبت و یون‌های کلر با بار منفی تجزیه می‌گردد.

1. Lots of substances, when dissolved in water, undergo dissociation, that is, a certain number of the molecules are broken down into charged particles or ions. For instance, ordinary salt dissolved in water somewhat dissociates into sodium ions with positive charge, and chlorine ions with negative charge.

2. A lot of substances, when dissolved in water, undergo dissociation, that is, some of the molecules are broken down into charged particles or ions. For example, common salt dissolved in water partially dissociates into sodium ions with positive charge, and chlorine ions with negative charge.

3. Many substances, when dissolved in water, undergo dissociation, i.e., some of the molecules are broken down into charged particles or ions. For example, common salt dissolved in water partially dissociates into positively-charged sodium ions, and negatively-charged chlorine ions.

4. Most substances, when dissolved in water, undergo dissociation, i.e., a certain number of the molecules are broken down into charged particles or ions. For instance, ordinary salt dissolved in water somewhat dissociates into positively-charged sodium ions, and negatively-charged chlorine ions.

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صفحه ۱۲ از ۱۸

Q45:

در صورتی که قطعه‌ای در معرض برگشت‌های متوالی تنش قرار گیرد، دچار خستگی می‌شود، و عمر آن به صورت قابل ملاحظه‌ای کوتاه‌تر از زمانی می‌شود که قطعه، بار ثابت را حمل نماید.

1. If a component is exposed to successive reversals of stress, it undergoes fatigue and its life is considerably shorter than it would be if the part carried a constant permanent load.
2. If an element is subjected to successive reversal of stress, it undergoes tiresome and its life is considerably shorter than it would be if the part carried a static constant load.
3. If a component is subjected to repeated reversals of stress, it undergoes fatigue and its life is considerably shorter than it would be if the part carried a static constant load.
4. If a part is exposed to repetitive reflection of tension it suffers from fatigue and its life is considerably shorter than it would be if the part transmitted an identical constant load.

D. Reading Comprehension Section (Questions Q46 to Q65):

Directions for Questions Q46 to Q65:

Answer all questions or complete the given sentences following the passages based on what is stated or implied in the passage.

D1. Passage No. 1 (Questions Q46 to Q49):

The internal structure of the airplane wing must be such that it can withstand the severe bending moments imposed by the combination of weight and lift. During flight, the wings of an airplane will support its maximum allowable gross weight. As long as the airplane is moving at a steady rate of speed and in a straight line, the load imposed upon the wings will remain constant.

A change in speed during straight flight will not produce any appreciable change in load, but when a change is made in the airplane's flight path, an additional load is imposed upon the airplane structure. This is particularly true if a change in direction is made at high speeds with rapid forceful control movements.

Q46:

According to the text, what is the cause of the severe bending moments?

1. Combination of weight and lift.
2. Adding the negative pressures.
3. Neutralizing the total upward force.
4. Decreasing the total downward force.

Q47:

"During flight, the wings of an airplane will support its maximum allowable gross weight."

The essence of this mechanism is the result of _____.

1. exerting the impact pressure at all points of airplane
2. equalizing the pressure exists above and to the rear of the cabin
3. the load imposed upon the wings that will remain constant
4. the load imposed upon the actual decreased total forces

Q48:

According to the passage, which statement is not true?

1. A change in speed produces any appreciable load.
2. A change in the airplane's flight path entails an additional load on the plane structure.
3. The wings cannot support its general load.
4. In straight line, the load exerted on the wings is constant.

Q49:

In sentence 1 “moment” is closest in meaning to _____.

1. a period of time
2. negative pressure
3. glance
4. torque

D2. Passage No. 2 (Questions Q50 to Q53):

Like it or not – and many people don’t – to one extent or another you have to deal with others to achieve any reasonable degree of success. This is true regardless of your station in life and no matter what your objectives may be. Further, the more successful you are in getting others to cooperate with you, and the more people you can solicit as allies, the greater your chances of achieving positive results, it can sometimes get very lonely and brutal in the Malevolent Jungle when those wild herds of humanoids start stampeding your homestead.

The issue of good human relations is pretty simple: to the extent you relate poorly to others, you tend to have a problem-filled life, and success comes hard, if at all; to the extent you relate well to others, you tend to have a pleasant life, and success comes relatively easy.

An individual can be brilliant at many things, yet be totally ignorant when it comes to getting along with, and gaining the cooperation of others. Everyone knows someone who is knowledgeable about a wide variety of subjects, but seemingly has zero knowledge of human relations. In most cases, it is because the otherwise knowledgeable individual has not taken the trouble to study human relations, or even to give the subject much thought. That is unfortunate, because, like all other habits, superior human relations is an art that anyone can learn. Some people may be born with more natural talent in this area than others, but that is true of virtually everything in life. More important is the fact that anyone can become better through practice.

Q50:

The main purpose of this passage is ...

1. to understand the necessity of better human relations.
2. to better human relations.
3. how to better human relations.
4. how to get along with more people.

Q51:

The author suggests that ...

1. having moody attitude in relating with others is an indication of success in life.
2. treating others with reverence will have a constructive impact on one’s life.
3. dealing with decency is a recipe for unfavorable reactions.
4. behaving courteously with others will have a deteriorating effect on life.

Q52:

According to the passage, a brilliant individual can ...

1. neglect human communications.
2. be oblivious about human relations.
3. deny the existence of human relations.
4. be excessive in relations with others.

Q53:

In the end, the author suggests that ...

1. if one is not born with these inherent skills, they fail to learn this art.
2. there exists certain innate characters that are unattainable.
3. if there is a will, there is a way.
4. there is hope to glean important capabilities exclusive of practice.

D3. Passage No. 3 (Questions Q54 to Q57):

The world's nuclear plants have accumulated vast stocks of highly radioactive waste. Worldwide, high-level waste is currently stored above ground, and no government has a clear policy on its eventual disposal. While most experts believe that burying the waste is the safest bet in the long term, the problem is finding sites that everyone can agree are geologically stable. Decaying radioactive isotopes release heat. As a result, high-level waste must be constantly cooled; otherwise, it becomes dangerously hot. This is why many experts want to store waste above ground until it has decayed and is cool enough to be stored safely in sealed repositories several hundreds of meters below ground. According to one recent theory, however, waste should be lowered down boreholes drilled to 4 kilometers. The trick is to exploit heat generated by waste to fuse the surrounding rock and contain any leaking radioactivity.

Q54:

It is clear from the passage that the safe disposal of radioactive waste ...

1. has been satisfactorily dealt with by scientists in conjunction with governments.
2. remains a global problem of great magnitude.
3. is a problem that has not attracted enough attention.
4. is a problem that each government must decide on for its own jurisdiction.

Q55:

As pointed out in the passage, many experts are of the opinion that radioactive waste ...

1. does not require to be cooled when stored above ground.
2. cannot be safely disposed of anywhere and the problem of what to do with it intensifies as the amount increases.
3. should not be stored underground while the radioactive isotopes continue to let off substantial amount of heat.
4. can be safely left to cool down underground in sealed repositories.

Q56:

The passage describes a new method, still only in a rudimentary stage, for the disposal of radioactive waste, ...

1. which, unfortunately, increases the time needed for cooling the waste before final disposal.
2. in which the radioactive isotopes are prevented from releasing heat.
3. which uses bore holes so that all sites are suitable.
4. whereby the heat produced by that waste will serve to seal it safely into the rock under which it has been buried.

Q57:

In the second sentence of the passage, the word "its" refers to ...

1. waste
2. ground
3. government
4. level

D4. Passage No. 4 (Questions Q58 to Q61):

It is a sound you will probably never hear, a sickened tree sending out a distress signal. But a group of scientists has heard the cries, and they think some insects also hear the trees and are drawn to them like vultures to a dying animal.

Researchers with the U.S. Department of Agriculture's Forest Service fastened sensors to the bark of drought-stricken trees and clearly heard distress calls. According to the scientists, most parched trees transmit their plight in the 50- to 500-kilohertz range, (the unaided human ear can detect no more than 20 kilohertz). Red oak, maple, white pine, and birch all make slightly different sounds in the form of vibrations at the surface of the wood.

Q58:

Which of the following is the main topic of the passage?

1. The vibrations produced by insects.
2. The mission of the U.S. Forest Service.
3. The effect of insects on trees.
4. The sound made by trees.

Q59:

The word "parched" in the text is closest in meaning to ...

1. burned
2. dehydrated
3. recovered
4. damaged

Q60:

The word "plight" in line 6 is closest in meaning to ...

1. cry
2. condition
3. need
4. agony

Q61:

It can be inferred from the passage that the sounds produced by the trees ...

1. serves as a form of communication among trees.
2. are the same no matter what type of tree produces them.
3. cannot be heard by the unaided human ear.
4. fall into 1~20 kilohertz range.

D5. Passage No. 5 (Questions Q62 to Q65):

You hear about lie detectors all the time in criminal investigations. Sometimes a person applying for a job will have to undergo a polygraph test. The goal of a lie detector is to see if the person is telling the truth or lying when answering certain questions.

When a person takes a polygraph test, four to six sensors are attached to him. A polygraph is a machine in which the multiple ("poly") signals from the sensors are recorded on a single strip of moving paper ("graph"). The sensors usually record:

- The person's breathing rate
- The person's pulse
- The person's blood pressure
- The person's perspiration

Sometimes a polygraph will also record things like arm and leg movements.

When the polygraph test starts, the questioner asks three or four simple questions to establish the norms for the person's signals. Then the real questions being tested by the polygraph are asked. Throughout questioning, all of the person's signals are recorded on the moving paper.

Both during and after the test, a polygraph examiner can look at the graphs and can see whether the vital signs changed significantly on any of the questions. In general, a significant change (such as a faster heart rate, higher blood pressure, or increased perspiration) indicates that the person is lying.

When a well-trained examiner uses a polygraph, he or she can detect lying with high accuracy. However, because the examiner's interpretation is subjective and because different people react differently to lying, a polygraph test is not perfect and can be fooled.

Q62:

What is the primary purpose of a polygraph test?

1. to gauge one's honesty.
2. to observe any changes in an individual's vital signs.
3. to detect if a person is lying or telling the truth.
4. to assess the veracity of official testimonies.

Q63:

According to the passage, "lie detector" refers to ...

1. a trained examiner who uses a polygraph machine.
2. a polygraph machine.
3. a machine that records the vital signs on a graph.
4. a trained examiner who examines the person's vital signs.

Q64:

The result of lying during a polygraph test is based on ...

1. a sustained variation in the person's vital signs.
2. the skills of the examiner and the character of the person.
3. the initial reactions to the questions asked by an examiner.
4. sudden fluctuations in the person's reactions.

Q65:

In the end, the author suggests that ...

1. the usage of polygraph tests have to be ceased in judiciary systems.
2. the examiners will be liable for their subjective opinion.
3. the polygraph results are to be counted on with high accuracy.
4. lie detector results might be inconclusive.