به نام خدا

دانشگاه صنعتی امیرکبیر
(پلی تکنیک تهران)

آزمون پذیرش دانشجوی دوره دکتری سال تحصیلی ۸۷-۸۶

(آزمون شماره ۱)

نام درس:	**زبان انگلیسی**
تعداد سوالات:	**۷۰ سوال (از سوال ۱ تا ۷۰)**
مدت زمان پاسخگویی به سؤالات:	**۹۰ دقیقه**
تاریخ برگزاری آزمون:	**پنجشنبه ۸۵/۱۲/۱۰**
ساعت شروع و خاتمه آزمون:	**۱۵-۱۶/۳۰**

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 17:
Fill in the blanks with the most appropriate word or phrase.

Q1:
A power failure occurred, …… the lamps went out.
1. so
2. finally
3. later
4. next

Q2:
Case studies are the target of much skepticism in the scientific community, …… used extensively by numerous researchers.
1. so are
2. they are
3. yet they are
4. yet they

Q3:
…… show the relations amount neurons, they do not preclude the possibility that other aspects are important as well.
1. Neural theories
2. What neural theories
3. However, neural theories
4. Although neural theories

Q4:
Without the proper card installed inside the computer, …… impossible to run a graphics program.
1. is definitely
2. it is
3. because of
4. is

Q5:
Scientists are now beginning to conduct experiments on …… trigger different sorts of health risks.
1. noise pollution
2. that noise pollution
3. how noise pollution can
4. how noise pollution

Q6:
The report on the nuclear power plant indicated that when the plant had gone on line …… safe.
1. it had been
2. and it had been
3. had been
4. that it had been

Q7:
Only in extremely dangerous situations …… stopped.
1. will be the printing presses
2. the printing presses will not be
3. will the printing presses be
4. that the printing presses be

Q8:
Potassium has a valence of positive one because it usually loses one electron when …… with other elements.
1. does it combine
2. it combines
3. combination
4. in combining

Q9:
Because bone loss occurs earlier in women than ……, the effects of osteoporosis are more apparent in women.
1. men do
2. in men
3. as men
4. similar to men

Q10:
Little is known about platinum …… so little of it exists.
1. because
2. but
3. why
4. although

Q11:
The x-ray treatments …… up to the time he was dismissed from the hospital.
1. gave daily
2. have given
3. daily had been given
4. were given daily

Q12:

…… with about fifteen times its weight in air does gasoline allow the carburetor to run smoothly.

1. It is mixed
2. To mix it
3. Only when mixed
4. When mixed

Q13:

When lava reaches the surface, its temperature can be ten times larger than …… boiling water.

1. the temperature
2. it is
3. more
4. that of

Q14:

The author of this journal paper is a …… professor.

1. sixty-years-old
2. sixty-year-old
3. sixty-year-olds
4. sixties-year-old

Q15:

It is imperative that a graduate student …… a grade point average of "B" in his/her major field.

1. maintain
2. maintains
3. to maintain
4. to be maintained

Q16:

No other quality is more important for a scientist to acquire …… to observe carefully.

1. as
2. but
3. than
4. then

Q17:

Please write out the answers to the questions at the end of …… .

1. eighth chapter
2. eight chapter
3. chapter eight
4. chapter the eight

A.2 Directions for Questions Q18 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.

Q18:

Being organized (A) is one of the (B) most important aspect (C) of being (D) a successful Ph.D. student.

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

Q19:

The occurrence edema (A) indicates (B) the presence of (C) a serious illness (D).

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

Q20:

Tungsten has the highest (A) melting point of all metals, and for this reason it is often use (B) in instruments (C) that must withstand (D) high temperatures.

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

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 phrase below each sentence. You must select the one word or phrase which most closely matches the meaning of the underlined word.

Q21:

If a researcher has an open mind, it would not be difficult to appreciate a peer's point of view.

1. agree with
2. respect
3. contradict
4. understand

Q22:
In an academic institution, the university should verify that the applicants for the advertised positions have the proper qualifications
1. measurements
2. forms
3. attire
4. credentials

Q23:
The building is so well constructed by the civil engineers that it will survive even the strongest earthquake.
1. located
2. guaranteed
3. built
4. insured

Q24:
Allowing recently published engineering books and journals to be sold at the exhibition would set a precedent for future conventions.
1. establish a pattern
2. start a fad
3. upset the people
4. be a first

Q25:
It is advisable to have an alternative plan in order to obtain more reliable experimental data.
1. a contingency
2. a better
3. an easier
4. an equal

Q26:
The results of the experiments on the new equipment have been in conclusive.
1. unpredicted
2. inappropriate
3. invalid
4. unconvincing

Q27:
According to the university officials, the scientific debate over the passage of this controversial bill was inevitable.
1. popular
2. disputatious
3. biased
4. personal

Q28:
In spite of his many faults, this researcher is very dedicated to his work.
1. agreeable
2. polite
3. devoted
4. considerable

Q29:
The person in charge of this lab will demonstrate how this specialized computer works.
1. deduce
2. necessitate
3. guess
4. show

Q30:
The technical argument by the designers, although understandable, was not very persuasive.
1. realistic
2. reliable
3. plausible
4. perceivable

Q31:
As far as the committee is concerned, there is no resolution to this scientific conflict.
1. disagreement
2. decision
3. condition
4. action

Q32:
The two theories are so far apart that one could say they are basically incompatible.
1. dissimilar
2. antagonistic
3. different
4. incomparable

Q33:
The sign at the lab requested that we extinguish the fire quickly after finishing the dangerous experiment.
1. plug in
2. put out
3. put down
4. push out

Q34:
The referees found sufficient merit in the paper to accept it for publication in the journal.
1. length
2. data
3. references
4. value

Q35:
Although she is recognized as one of our most brilliant Ph.D. students, she cannot seem to make her ideas understood in class.
1. get her ideas across
2. get her ideas down
3. summarize her ideas
4. recall her ideas

Q36:
Even though the evidence is overwhelming in supporting his theory, if a majority of the committee is still skeptical, the case must be retired.
1. not present
2. not surprised
3. not certain
4. not worried

Q37:
Phosphorus is used in paints for highway signs and markers because it is glowing at night.
1. adequate
2. luminous
3. harmless
4. attractive

Q38:
The Head of Department has a reputation for being just when dealing with scientific issues.
1. impartial
2. stubborn
3. humorous
4. capricious

Q39:
To look quickly through a book is an important study skill.
1. outline
2. summarize
3. paraphrase
4. skim

Q40:

The perpetual rotation of the earth as it turns on its axis produces a considerable number of phenomena.

1. ancient
2. leisurely
3. constant
4. rhythmic

C. Translation Section (Questions Q41 to Q50):

Directions for Questions Q41 to Q50:

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

Q41:

نفوذ جریان اکسیژن، در حضور گلوکز، کاهش پیدا می کند.

1. The flow diffusion of oxygen is reduced in the absence of the glucose.
2. The flow diffusion of oxygen is enhanced in the presence of the glucose.
3. The diffusion flow of oxygen is intensified in the absence of the glucose.
4. The diffusion flow of oxygen is decreased in the presence of the glucose.

Q42:

محصولات زائد، قبل از اینکه از موتور خارج شوند، تا دمای محیط خنک می شوند.

1. The products are cold due to the surrounding temperature before being discharged from the engine.
2. The waste products are cooled to surrounding temperature before being discharged from the engine.
3. The waste products are cooled to surrounding temperature before discharging the engine.
4. The products are cold due to the surrounding temperature before discharging the engine.

Q43:

در علوم مهندسی، تمایز قائل شدن بین بازگشت ناپذیری داخلی و بازگشت ناپذیری خارجی، غالبا از مزایائی برخوردار است.

1. In engineering sciences, it is frequently advantageous to distinguish between internal and external irreversibility.
2. In engineering sciences, to distinguish frequently between internal and external irreversibility is advantageous.
3. In engineering sciences, it is frequent to distinguish between internal and external irreversibility.
4. In engineering sciences, to distinguish between internal and external irreversibility is frequent.

Q44:

به خاطر نیاز به دقت، طراحی دستگاههای اندازه گیری کننده برای این کاربرد، تا حدودی در گذشته به عنوان یک مشکل، مطرح بوده است.

1. The design of meters for this application has been quite a problem in the past in consequence of precision needed.
2. The design of meters for this application has not been a serious problem in the past in consequence of the need for precision.
3. The design of meters for this application has been somewhat of a problem in the past in consequence of the need for precision.
4. The design of meters for this application has been a relatively moderate problem in the past in consequence of precision needed.

Q45:

دانشجو می تواند درستی این جواب را با قرار دادن آن در معادله (۱) تحقیق کند.

1. The student may verify this solution by eliminating it from equation (1).
2. The reader may check this solution by putting it into equation (1).
3. The student may verify this solution by substituting it into equation (1).
4. The student may find this solution by solving equation (1).

Q46:

درست توجه کنید که روش حاضر جواب را به صورت ضمنی به دست می دهد.

1. Note well, that the present method gives the solution in implicit form.
2. Note well, that the present method gives the solution in explicit form.
3. Note carefully, that this method gives the solution in implicit form.
4. Note carefully, that the previous method gives the solution in an indirect way.

Q47:

تکنولوژی الکترونیک تغییرات زیادی در ارتباط بین انسانها با یکدیگر بوجود آورده است.

1. Electronic Technology has produced insignificant changes in the way that humans need.
2. Electronic Technology has produced significant changes in the way that humans interact.
3. Electronic Technology has dispersed significant changes in the way that human interact.
4. Electronic Technology has dispersed insignificant changes in the way that humans need.

Q48:

امروزه، چالشی در علوم کامپیوتر وجود دارد تا بتواند معماری مغز را از بعد محاسباتی مورد بررسی قرار دهد.

1. Nowadays, it is a difference to computer science to understand the architecture of the brain from a computational viewpoint.
2. Nowadays, it is a challenge to computer science to understand the structure of the brain from a computational viewpoint.
3. Nowadays, it is a difference to computer science to understand the architecture of the brain from a scientific viewpoint.
4. Nowadays, it is a challenge to computer science to understand the architecture of the brain from a computational viewpoint.

Q49:

دانشگاه صنعتی امیرکبیر در بین دانشگاههای مهندسی در ایران بهترین است.

1. Amirkabir University of Technology is the best among the engineering universities in Iran.
2. Amirkabir University of technology is the best university.
3. Iran is the best among the engineering universities.
4. Amirkabir University of Technology is the best between the engineering universities in Iran.

Q50:

محاسبات ریاضی در طراحی یک ماشین باید در نظر گرفته شود.

1. One should consider mathematical calculations in the design of a machine.
2. One should calculate the design of the machine.
3. One should be considering the design of a machine.
4. One should be calculated the design of a machine.

D. Reading Comprehension Section (Questions Q51 to Q70):

Directions for Questions Q51 to Q70:
Answer all questions or complete the given sentences following the passages on the basis of what is stated or implied in the passage.

D1. Passage No. 1 (Questions Q51 to Q55):

We describe some of the important properties of the antiderivative and the definite integral and give a notation for the antiderivative. Frequently, an antiderivative is called an integral or indefinite integral. There is a danger that "integral" will become confused with "definite integral". It should be kept in mind that the definite integral $\int_a^b f(x).dx$ **is defined as a number, a limit of certain sums, while an integral or antiderivative is a function. Sometimes, in application, both the definite integral and the indefinite integral are called integrals; it takes a clear mind and mastery of the definitions to keep the ideas separate. The table of integrals in a mathematical handbook is primarily a table of antiderivatives (functions); it is usually followed by a short section that lists the values of a few common definite integrals (numbers).**

Q51:
An antiderivative is …….
1. an integral.
2. a function.
3. an indefinite integral.
4. all of the above.

Q52:
A definite integral is …….
1. the sum of certain limits.
2. a number.
3. a derivative.
4. all of the above.

Q53:
The main purpose of this passage is …….
1. to distinguish between antiderivative and indefinite integral.
2. to enumerate certain properties of integrals.
3. to distinguish between antiderivative and definite integral.
4. to clarify the meaning of indefinite integral.

Q54:

According to the passage, …….

1. the table of integrals consists mainly of numbers
2. it is not so easy to distinguish between definite and indefinite integrals.
3. antiderivative is the opposite of definite integral.
4. ideas expressed in this passage are confusing and difficult to master.

Q55:

In the last line of the passage, “common” mean ……..

1. average
2. shared by two or more
3. public
4. widespread

D2. Passage No. 2 (Questions Q56 to Q60):

The basic laws of thermodynamics are contained in three laws. The first states that heat can be converted into work, and conversely, work into heat, with the amount of work equal to the quantity of heat, expressed in terms of energy. The second law stated that when a free exchange of heat takes place between two bodies as a self-containing and continuous process, the heat must always be transferred from the hotter to the colder body.

The third law of thermodynamics stated that every substance known to man has a definite entropy (availability of energy to do work) that approaches zero as its temperature nears absolute zero (ж). As the energy becomes unavailable, the entropy is said to increase. In an isolated system (one that can be so constituted as to have no exchange of energy with its environment), entropy may remain unchanged or increase but can never decrease. The practical aspect of entropy is that it is not possible, in an isolated system, for a transformation to occur that will produce as much energy in the form of work as has been available in the form of heat; i.e., no system transferring heat into mechanical energy can be completely efficient. The variables in thermodynamic processes are entropy, pressure, temperature, and volume.

In many chemical reactions, the first law (conservation of energy) is not always evident, energy being hidden in forms not easily recognized (its forms include kinetic, potential, mechanical, electrical, nuclear, surface, radiant, and so on). However, energy cannot be spontaneously created but must always involve transformations of one type or another (жж). For example, it is impossible to design an engine that will work without fuel or some other source of energy. Nor will an engine be able to convert all of the heat obtained from fuel into mechanical energy, being able to convert only a part, depending on certain thermodynamic conditions.

Some of these conditions, which permit a more complete definition of the state of a system, are inherent in the second law of thermodynamics (жжж). Free energy and entropy, for example, are used to study equilibrium conditions in matter. Free energy must necessarily diminish in spontaneous reaction; otherwise, the reaction could not proceed (жжжж).

Q56:

Which statement is related to the second law?

1. Heat is transferred from the hotter body to the colder.
2. Heat can be converted into work and vice versa.
3. Every substance has definite entropy.
4. Conservation of energy is not always evident.

Q57:

What does the word “entropy” in line **(ж)** means?

1. exchange of energy
2. absolute zero temperature
3. isolated system
4. availability of energy to do work

Q58:

What does the word “spontaneously” in line **(ЖЖ)** mean?

1. slowly
2. gradually
3. automatically
4. steadily

Q59:

What does the word “which” in line **(ЖЖЖ)** refer to?

1. conditions
2. these conditions
3. some of these conditions
4. complete definition

Q60:

What does the word “diminish” in line **(ЖЖЖЖ)** mean?

1. become less
2. maximize
3. build up
4. increase

D3. Passage No. 3 (Questions Q61 to Q65):

When scientists are trying to understand a particular set of phenomena, they often make use of a “model”. A model, in the scientists’ sense, is a kind of analogy or mental image of the phenomena in terms of something we are familiar with. One example is the wave model of light. We cannot see light as if it were made up of waves because experiments on light indicate that it behaves in many respects as water waves do. The purpose of a model is to give us mental or visual picture – something to hold onto – when we cannot see what is actually happening. Models often give us a deeper understanding. In other words, the analogy to a known system (for instance, water waves in the above example) can suggest new experiments to perform and can provide ideas about what other related phenomena might occur.

Q61:

The author is concerned with an explanation of the term …..

1. wave.
2. model.
3. analogy.
4. water.

Q62:

Based on the given passage, another example of a scientific model would be ….

1. a map.
2. a paper airplane.
3. a light bulb.
4. an atom.

Q63:

Why are models necessary?

1. Scientists could not experiment without them.
2. They give the scientist a sense of security.
3. They connect invisible phenomena to those we are familiar with.
4. They provide deeper insight into the workings of the human mind.

Q64:

Models provide us with deeper understanding because ….

1. they indicate further directions and help us make predictions.
2. they make us think about our universe.
3. they were used to represent some other phenomenon.
4. they are more precise than theories.

Q65:

An analogy is ….

1. the study of the universe.
2. the study of the light waves.
3. a comparison.
4. the result of scientific investigation.

D4. Passage No. 4 (Questions Q66 to Q67):

Regular tune-ups of your heating system will cut heating costs and will most likely increase the lifetime and safety of the system. When a service technician performs a tune-up, he or she should test the efficiency of your heating system. The technician should measure the efficiency of your system both before and after servicing it and provide you with a copy of the results. Combustion efficiency is determined indirectly, based on some of the following tests: 1) temperature of the flue (or chimney); 2) percent carbon dioxide or percent oxygen in the atmosphere; 3) presence of carbon monoxide in the atmosphere; and 4) draft. Incomplete combustion of fuel is the main contributor to low efficiency. If the technician cannot raise the combustion efficiency up to at least 75% after tuning your heating system, you should consider installing a new system or at least modifying your present system to increase its efficiency.

Q66:

The passage suggests that the presence of carbon monoxide in the atmosphere…….

1. is found in 75% of heating systems tested.
2. can provide information regarding combustion efficiency.
3. is the main cause of low efficiency in heating systems.
4. is more reliable than flue temperature as an indicator of combustion efficiency.

Q67:

According to the passage, when performing a tune-up of a heating system, the service technician should……

1. modify the heating system before initially measuring efficiency.
2. provide his or her supervisor with a written report of the system’s efficiency.
3. ensure that the combustion efficiency is at least 75%.
4. measure combustion efficiency both before and after servicing the system.

D5. Passage No. 5 (Questions Q68 to Q70):

Thank you for calling T-R-A-I-L, or TRAIL, the taped registration and information line. The TRAIL system operates 24 hours a day, 7 days a week. If you want information about classes offered by the college, press 1. If you want to register for specific classes, press 2 and follow the instructions. You will have 15 minutes to register. You must confirm your registration by pressing the zero key before you hang up or the computer won't accept your registration. If you have any questions, call the registration office at 555-4933. Press 1 for information or 2 to register now.

Q68:

What is the TRAIL system used for?

1. To speak to someone at the Registration Office.
2. To go to classes.
3. To get information and register for classes.
4. To get your grades.

Q69:

What will happen if you do NOT confirm your registration?

1. The computer will not accept your registration.
2. You will have to pay more.
3. The computer will change your registration.
4. You will need to take more classes.

Q70:

How long the callers have time to register?

1. Only 2 days a week.
2. Callers have to press zero.
3. Only 60 seconds.
4. Only fifteen minutes.