فعل در زبان انگلیسی ۳ حالت دارد

1) Past
a) simple past
regular v+ed
irregular
Play+ed → played

2) Present
حال ساده
حال استمراری
آینده نزدیک

آینده نزدیک: اگر کاری در زمان آینده بسیار نزدیک یا با قطعیت زیاد انجام شود آن را حال در نظر می‌گیریم (مثلاً دارم میام تهران)

3) future

ساختار حال ساده: فعل در زمان حال ساده؟ صورت ساده می‌آید مگر برای سوم شخص مفرد که به انتهای فعل حرف s اضافه می‌کنیم

مثال I Play piano she swims well

حال استمراری: کاری که در حال انجام آن هستیم

am / is / are + m.r+ing (فعل اصلی)

we are eating meat now

مثال گذشته
she played tennis yesterday
He drank coffee yesterday morning

Past
b) present perfect

ماضی نقلی: کاری که در زمان گذشته انجام شده ولی تأثیر آن هنوز هست.

مثال
The child has broken the windows
He has passed an accident
I have broken my are

مثال: there is car

مفرد وجود داشتن

There is / was — isn't / wasn't

There are / were — aren't / weren't people

جمع وجود داشتن

There were so many people in Ancient India

برای سوال کردن این جملات جای فعل و فاعل را عوض می‌کنیم

افعال modal → can could توانستن

shall should باید

will would معنای آینده

may might ممکن بودن

فعلی که بعد از modal می‌آید ساده است

مثال ← It may rain

ممکن است باران ببارد

1) The weather ____ last week. a) is good b) was good
c) were good d) had good

2) Jack was reading a book when his phone ____.
a) ringing B) ring c) rang d) was ring

3) I saw Lucy and Steve this morning. They ____ at the bus stop.
a) waiting b) waited c) were waiting d) was waiting

4) where's Rebecca? ____ to bed. a) she's gone b) she's gone
c) she has gone d) she have gone

5) when did Tom go out? a) for ten minutes
b) since ten minutes
c) ten minutes ago
d) in ten minutes

6) I can't find my keys. I think ____.
a) They've been stolen. c) they're stolen
b) They are stolen. d) They're being stolen

answers:
1) b 2) c 3) c 4) b 5) c 6) a

Lesson 7:

variety : تنوع
resistance : مقاومت
Fig : انجیر
molded : قالب گیری شده
tolerance : تحمل
numerical : عددی
precision : دقیق
assume : فرض کردن
digit : رقم
omitte : حذف شده

grammer

قواعد : افعال در زبان گذشته به دو صورت قرار می گیرند:

۱) افعال باقاعده : مثل هایی که در جدول بی قاعده ها وجود ندارد و با اضافه کردن ed به آخر فعل ساخته می شود.

۲) افعال بی قاعده : باید در جدول این فعل ها حفظ شوند.

* مثل هایی که هردو نوع باقاعده و بی قاعده ی آن ها وجود دارد.

مثال: clear → cleared (گذشته ساده، باقاعده)
مثال: go → went (گذشته ساده، بی قاعده)
مثال: learn → learned / learnt (گذشته ساده، هردو نوع)

Ex: The servant cleared all the lobby this morning.
Ex: The army went out of the city, last month.
Ex: she learnt how to adjust herself.

inf	past	P.P
hide	hid	hidden
know	knew	known
make	made	made
ride	rode	ridden
see	saw	seen
sell	sold	sold
send	sent	sent
write	wrote	written

inf	past	P.P
be	was / were	been
buy	bought	bought
come	came	come
cut	cut	cut
do	did	done
drive	drove	driven
get	got	got / gotten
go	went	gone

lesson 3

electricity. برق، الکتریسیته — substation: ایستگاه فرعی
industrial: صنعتی — development: توسعه
desigh: طراحی کردن — specialized: تخصصی شده بای
propagation: تکثیر — precise: دقیق
aircraft: هواپیمایی — component: جزء
definition: تعریف — principle: مرحله

grammer

it, There قواعد

There is/was/isn't/wasn't
There are/were/aren't/weren't
it + (is/isn't / was/wasn't) + adj + (for + object) + infinitive
optional — to فعل

در حالتی که با it شروع می‌شود بعد از فعل tobe صفت می‌آید و بعد مصدر با to می‌آوریم
برای هر چیزی که وجود داشته باشد از There استفاده می‌کنیم

It is impossible (for me) to go there.
was is hard (for you) to set the آماده table?
adj — infinitive
There is a cat under the tree.
Are there so many house here?

Excuse me. ____ a hotel near here? a) has there
b) is there c) there is d) it is
2) ____ a lot of accidents on this, It's very dangerous.
a) have b) is c) has D) hasn't E) has got
3) Nicola got married last week. ____ really?
A) Is she? b) Got she? C) Did she D) has she?
4) you haven't met my mother. ____? a) haven't you
b) have you c) did you D) you have E) you haven't
5) I'd like to go to Australia ____ is fine. a) so do I
b) there is c) there D) here

lesson 2:

appliance: دریافت — concern: نگرانی — generation: تولید، نسل
broad: گسترده — efficient: کارآمد — distribution: توزیع
frequency: تکرار — imagine: تصور کردن — industrial: صنعتی
recent: اخیرا — Capacity: توانایی — misunderstood: سوء تفاهم
primary: ابتدایی — describe: توصیف کردن — operation: عمل

grammer

قواعد: ضمایر و صفات ملکی

subjects	صفت ملکی	مفعولی	ضمیر ملکی
I	my	me	mine
You	Your	you	Yours
she	her	her	hers
he	his	him	his
we	our	us	ours
They	Their	Them	Theirs
it	its	it	its

مثال: صفت مفعولی بعد از فعل ← Give me the book — یا بعد از حرف اضافه: Give the book to me

It's my umbrella. (my = adj, umbrella = noun) — مثال: صفت ملکی قبل از اسم می‌آید

It's not mine. It's his. — مثال: ضمیر ملکی بعد از فعل tobe می‌آید و بعد از حرف اضافه

- I don't want this book you can have ..... a) it b) them c) her D) him
- sue and kevin are going to the cinema. Do you want to go with .....?
a) her b) they c) them d) him
- I went out to meet a friend of ...... a) mine b) my b) me D) I

answers: 1) a 2) c 3) a)

I usually listen to ___ radio while I'm having ___ breakfast.
a) the, ___ b) ___, the c) a, the D) a, ___
answer: a
- After Dinner, we watched ___ TV.
a) ___, ___ b) a, a c) the, the D) a, the
answer: a

lesson 4:

decentralize: غیرمتمرکز environmental: محیطی storage: انبار
Conventional: متعارف flexible: انعطاف
capacity: توانایی، ظرفیت modular: ماژولار، پیش‌ساخته
impact: تاثیر، فشار renewable: تجدیدپذیر

grammer قواعد:

بعد از افعال modal شامل Can Could must, تنها فعل ساده می‌آوریم.
shall should
may might
will would

- It's late, I must ___ now. a) go b) to go c) going D) went
answer: a
- Could you ___ me with this bag please? a) help b) to help c) helping D) helped
answer: a

بعد از let, make فعل ساده می‌آید
- the medicine made me .... better.
a) feel b) feeling c) to feel D) felt answer: a
- let him ..... a) go b) to go c) want D) going
answer: a

6) ___ true that you're going away?
a) Is there b) Is it c) is D) Are you
7) ___ three kilometers from our house to the city center.
a) It's b) It has c) there is D) there are
8) I was hungry when I got home, but ___ anything to eat.
a) there wasn't b) there weren't c) it wasn't D) there hasn't been

1) b 2) E 3) D 4) b 5) D 6) b 7) D
8) a

lesson 5:

solar Energy = انرژی خورشیدی — supply = عرضه
radiant = تابان — semiconducting = نیمرسانا
harnessed = مهار — expanding = گسترش دادن
artificial = مصنوعی — electricity = برق
photosynthesis = فتوسنتز — sustainable = پایدار
exhibit = نمایشگاه — momentum = حرکت
manufacture = ساختن — intensity = شدت
junction = اتصال

grammer = قواعد

a,an, the

the را قبل از اسم‌های خاص (مثل اسم کشورها، اقیانوس‌ها، رودخانه‌ها، کوه‌ها، کتاب‌های مقدس، اسم‌های منحصربه‌فرد) و صفت‌های برتر (the best) و اسم‌هایی که قبلاً معرفی شده‌اند (known) می‌آوریم.

- who is ___ best player in your team?
a) the b) — c) a D) an answer: a

the را قبل از اسم‌های خاص مثل خانه‌ها، مکان‌ها، مغازه‌ها و ... نمی‌آوریم.

- we are at ___ Hafiz shrine. a) — b) the c) a D) an
answer: a

a/an را قبل از اسم‌های نکره (ناشناخته) (unknown) می‌آوریم. اسم‌هایی که قابل شمارش نیستند را هم نمی‌آوریم.

- Is there ___ bank near here?
a) a b) the c) an D) — answer: a

- I usually listen to ___ radio while I'm having ___ breakfast.
a) the, — b) —, the c) a, the D) a, —
answer: a

- After Dinner, we watched ___ TV
a) —, — b) a, a c) the, the D) a, the
answer: a

lesson 4:

decentralize: غیرمتمرکز — environmental: محیطی — storage: انبار
Conventional: متعارف — flexible: انعطاف‌پذیر
capacity: ظرفیت، توانایی — modular: واحدهای کوچک پیش‌ساخته
impact: تأثیر، شتاب — renewable: تجدیدپذیر

grammer: قواعد

افعال کمکی Modal شامل must, Can, Could هستند که همیشه قبل از فعل ساده می‌آیند.

shall should
may might
will would

- It's late, I must ___ now. a) go b) to go c) going D) went
answer: a

- Could you ___ me with this bag please? a) help b) to help c) helping D) helped
answer: a

- the medicine made me .... better.

بعد از افعال let, make فعل ساده می‌آید

a) feel b) feeling c) to feel D) felt answer: a

- let him .... a) go b) to go c) want D) going
answer: a

LESSON 1

Color Coding and Standard Resistor

A wide variety of resistors, fixed or variable, are large enough to have their resistance in ohms printed on the casing. There are some, however, that are too small to have numbers printed on them, so a system of color coding is used.

For the fixed molded composition resistor, four color bands are printed on one end of the outer casing as shown in Fig (a). Each color has the numerical value indicated in Table (B). The color bands are always read left to right from end that has the band closest to it, as shown in Fig (a).

The first and Second bands represent the first and second digits, respectively. The third band is the number of zeroes that follow the second digit, or a multiplying factor determined by the gold and silver bands.the fourth band is the manufacturer's tolerance, which is a measure of the precision by which the resistor was made. If the fourth band is omitted, the tolerance is assumed to be 20%.

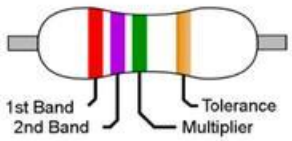
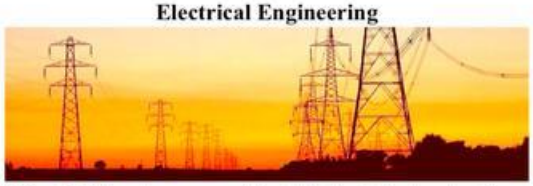


Fig (a): resistor color coding

LESSON 2

Electrical Engineering



Student: Could you give me a general idea of what electrical engineering is like today? My knowledge is pretty much limited to the appliance around our house.

Professor: I'll try although it's a very broad field. To start with, there is the power engineer. The problems he deals with concern the efficient generation and distribution of electrical Power.

Student: What are some of the problems?

Professor: They have to do, for example, with the voltage at which power plant must be generated. Then there are the problems of controlling the phase, the frequency and the loads of power system.

Student: I imagine this is one of the oldest areas of electrical engineering.

Professor: Yes, but it is still a very important and complex field. More recent are the Fields of communications, computers, and industrial electronics.

Student: Could you give me an idea of what they are?

Professor: In communications, Of course, the object is to send messages of many types from one Location to another, Modulation, channel capacity, and waveguides are only a few of the problems that come up .

Student: I see.

Professor: The term "computer" is often misunderstood. Some computers handle basically simple problems of arithmetic at unbelievably high speeds. There are other types, however. And the primary purpose of industrial electronics is to control large amounts of power.

Student: That gives me a pretty good idea. i think.

Lesson 3

Power and Electronics


Electrical engineering is primarily concerned with the generation, control and use of electricity. There are two main divisions: power and electronics.

The power field deals with the generation of large amounts of energy for cities and industries. It includes the design and operation of steam, hydroelectric and nuclear power-plants. An electrical engineer also supervises the construction of electrical transmission and distribution lines and substation.

The electronics field is concerned with the use of small amounts of energy for communication and related functions. Electronics serves to extend the nerves and brains of human Beings through instruments and controls.

These two main divisions have many specialized arias of work, including the following:

Illumination: the design of lighting systems and equipment for streets, homes and industrial building

Wire communication: the design and operation of telephone, telegraph and teletype circuits, long distance cables, and alarm and signal systems.

Electrical apparatus and machinery: the development of devices such as meters, generators, frequency, chargers and transformers.

Radio and television: the study of new designs and applications for radio transmission and receivers, television, radar and electromagnetic wave propagation, the design and use of tubes and transistors for improved radio and television transmission.

Instrumentation and control: the development and use of precise measuring equipment, such as Oscilloscopes, and of controls like relays, governors and switchboards for a variety of purposes, And application

of which often leads to automation; computers and navigational systems for guided Missiles

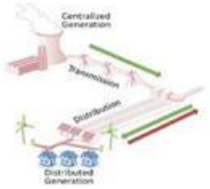
Transportation: the designing of special electrical equipment for railroads, ships and aircraft; in the production of automobiles, wiring, circuitry, storage battery problems and related projects.

Lesson 4

Distributed Generation

Distributed energy, also district or decentralized energy is generated or stored by a variety of small, grid-connected devices referred to as distributed energy resources (DER) or distributed energy resource systems.

Conventional power stations, such as coal-fired, gas and nuclear powered plants, as well as hydroelectric dams and large-scale solar power stations are centralized and often require electricity to be transmitted over long distances. By contrast, DER systems are decentralized, modular and more flexible technologies that are located close to the load they serve, albeit having capacities of only 10 megawatts (MW) or less.



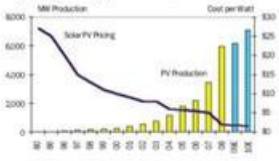
DER systems typically use renewable energy sources, including, but not limited to, biomass, biogas, solar power, wind power, geothermal power and increasingly play an important role for the electric power distribution system. A grid-connected device for electricity storage can also be classified as a DER system, and is often called a distributed energy storage system (DESS). DER systems can be managed and coordinated within a smart grid. Distributed generation and storage enables collection of energy from many sources and may lower environmental impacts and improve security of supply.

Photovoltaic

Solar energy is radiant light and heat from the sun harnessed using a range of ever-evolving technologies such as solar heating, solar photovoltaics, solar thermal electricity, solar architecture and artificial photosynthesis.

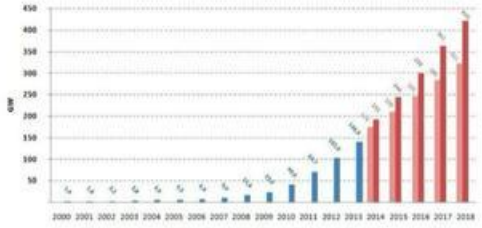
Photovoltaics (PV) is a method of generating electrical power by converting sunlight into direct current electricity using semiconducting materials that exhibit the photovoltaic effect. A photovoltaic system employs solar panels composed of a number of solar cells to supply usable solar power.

Power generation from solar PV has long been seen as a clean sustainable energy technology which draws upon the planet's most plentiful and widely distributed renewable energy source, the sun. The direct conversion of sunlight to electricity occurs without any moving parts or environmental emissions during operation. It is well proven, as photovoltaic systems have now been used for fifty years in specialized applications, and grid-connected PV systems have been in use for over twenty years.



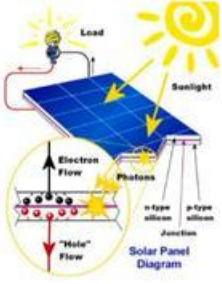
Driven by advances in technology and increases in manufacturing scale and sophistication, the cost of photovoltaics has declined steadily since the first solar cells were manufactured, and the levelised cost of electricity from PV is competitive with conventional electricity sources in an expanding list of geographic regions.

Solar PV is now, after hydro and wind power, the third most important renewable energy source in terms of globally installed capacity. More than 100 countries use solar PV



How PV cell works?

A typical silicon PV cell is composed of a thin wafer consisting of an ultra-thin layer of phosphorus-doped (N-type) silicon on top of a thicker layer of boron-doped (P-type) silicon. An electrical field is created near the top surface of the cell where these two materials are in contact, called the P-N junction. When sunlight strikes the surface of a PV cell, this electrical field provides momentum and direction to light-stimulated electrons, resulting in a flow of current when the solar cell is connected to an electrical load



Regardless of size, a typical silicon PV cell produces about 0.5 – 0.6 volt DC under open-circuit, no-load conditions. The current (and power) output of a PV cell depends on its efficiency and size (surface area), and is proportional to the intensity of sunlight striking the surface of the cell.